federal register

TUESDAY, MAY 24, 1977

PART VIII

CIVIL AERONAUTICS BOARD

■

DISCOUNT FARE POLICY

Statements of General Policy

CIVIL AERONAUTICS BOARD

[14 CFR Part 399]

[PSDR-47; Docket 30891; Dated May 16, 1977]

STATEMENTS OF GENERAL POLICY

Discount Fare Policy

MAY 16, 1977.

AGENCY: Civil Aeronautics Board.

ACTION: Advance notice of proposed rulemaking.

SUMMARY: At the present time, the Board evaluates discount fares proposed by the airlines for trips within the 48 contiguous States on the basis of a profit-impact test. If the airline convinces the Board that the net revenues from the fare offset the added costs of carrying the new passengers generated by the fare, the Board permits the fare to become effective without investigation. It is often difficult, however, to determine in advance whether a particular fare will meet this test. Accordingly, the Board has decided to solicit public views on whether it should change the test for evaluating discount fares, and, if so, what standards should be used instead.

DATES: Comments by July 25, 1977.

ADDRESSES: Comments should be sent to Docket 30891, Docket Section, Civil Aeronautics Board, Washington, D.C. 20428. Docket comments may be examined at the Docket Section, Civil Aeronautics Board, Room 711, Universal Building, 1825 Connecticut Avenue NW., Washington, D.C., as soon as they are received.

FOR FURTHER INFORMATION CONTACT:

Richard Juhnke, Rates and Agreements Division, Civil Aeronautics Board, 1825 Connecticut Avenue NW., Washington, D.C. 20428, 202-673-5436.

SUPPLEMENTARY INFORMATION: In Phase 5 of the *Domestic Passenger-Fare Investigation*, Docket 21866-5,[1] the Board concluded that, in the long run, discount fares which are not based on cost savings are uneconomic. However, the Board also found that, in the short run, such discount fares may be useful in periods of excess capacity, in developing new routes and markets, and in stimulating traffic in thin markets served at low load factors with a minimum service pattern. The Board therefore determined for purposes of passenger fares in the 48 States, to allow the carriers to offer discount fares subject to polices designed to protect normal-fare traffic from the revenue dilution from discount fares, and to assure that the discount fares produce favorable results in the short run. In the latter regard, the Board adopted a profit-impact test to measure the short term economics of a discount fare, and a policy that discount-fare tariffs should be marked to expire after an eighteen-month period to assure that the fares continue to be warranted. These policies were codified in § 399.33(f) of our Statements of General Policy (14 CFR 399.33(f)),[2] as follows:

(f) With respect to discount fares not based on cost savings:

(1) Carriers should be free to utilize discount fares within their managerial discretion, subject to the conditions that such fares are not unjustly discriminatory and meet the profit-impact test (i.e., that they generate sufficient traffic to more than offset the diversion of full-fare traffic and the added noncapacity costs associated with the generated traffic less any savings in cost attributable to the nature of the service provided to the discount traffic); and

(2) Promotional-fare tariffs should contain expiration dates not to exceed 18 months from the effective date;

As these policies are applied, carriers proposing to initiate new discount fares must include a showing of profit impact in their justification. This requires estimates of the amount of traffic that will be newly generated by the fare, how much traffic will instead be diverted from other fares, and the net added costs attributable to carrying the newly generated traffic. If carriers wish to renew the fares after their initial expiry date, they must include an analysis of profit impact based on the actual results of the fare.

While there has been no general opposition to the concept of the profit-impact test, as a practical matter the test has been difficult to administer. This is due both to the nature of the test and to the procedural framework in which it most often comes into play. With respect to newly proposed discount fares, the analysis of traffic generation and diversion is a prediction of future behavior which cannot be reduced to mathematical certainty. Furthermore, estimating the added costs attributable to the newly generated traffic necessarily involves some degree of judgment. Even in the context of the renewal of a discount fare, an evaluation of the actual results achieved with the fare still presents the problem of ascertaining how many passengers who used the fares were passengers who would have flown in any event, and leaves room for dispute as to the added costs attributable to the generated traffic. Moreover, the profit-impact analysis is most frequently utilized in connection with carrier tariff filings—i.e., the decision whether or not to institute a formal investigation. In this procedural framework, the Board must reach its determination in a very short period of time on the basis of written pleadings of the interested parties with no opportunity for an in-depth examination of the assumptions and judgments underlying the parties' analyses.[3]

While the profit-impact test was adopted in Phase 5 more than four years ago, the experience gained by the Board and the carriers with the use of this test has not narrowed the areas of dispute. Thus the Board is frequently called upon to referee disputes among competing carriers as to whether particular discount fares should be permitted to take effect. The Board recognizes the undesirable consequences which can flow from imprudent use of discount fares. At the same time, however, the suspension of a discount fare can be viewed as a determination of the Board that a carrier needs to be protected from its own managerial decision; suspension further means that the public will be deprived of the potential benefits of the discount fare. The Board is troubled by having to use such an imprecise test as the profit-impact analysis for the basis of such determinations.

For these reasons, the Board has decided to explore whether the profit-impact test and 18-month expiry period should be reevaluated. The Board has not concluded that there necessarily should be a change in the way in which it evaluates discount fares; it may well be that with all its imperfections, the profit-impact test does perform a useful function in a reasonably reliable manner overall. Nonetheless, the issue is of sufficient concern to the Board that the Board believes it is desirable to explore the merits of the present standards and possible alternatives to those standards. Thus the Board is interested in receiving comments whether a change in the present policies regarding the evaluation of discount fares is warranted, and if so, what policies or procedures should be used instead. To stimulate response on these issues, we have listed below a number of possible alternatives. However, this list should not be regarded as exhaustive. On the contrary, the Board is receptive to other suggestions and would be particularly interested in any forms of analysis that the carriers may use for their own evaluation of discount fares.

ALTERNATIVES TO PRESENT PHASE 5 POLICIES

A. Eliminate the profit-impact test as a standard for determining the reasonableness of discount fares, and allow the carriers to offer any type of discount fare unless it is predatory or unjustly discriminatory. The requirement that discount tariffs be marked to expire within 18 months would also be eliminated. This is essentially the approach we adopted for the mainland-Hawaii markets in our recent decision in the *Hawaii Fares Investigation*, Order 76-10-37, October 8, 1976.[4] This approach would give carrier management significant flexibility in pricing discount fares, as well as the responsibility for the consequences which may flow from the exercise of that flexibility. Since the Board would continue to remove the impact of discount fares from computations of the normal-fare level, carrier management would be discouraged from introducing discount fares which were uneconomic. Presumably carrier management would monitor the profita-

[1] Order 72-12-18; see, also, the opinion and order on reconsideration, Order 73-5-2.

[2] PS-63, February 7, 1975.

[3] Even in formal investigations of discount fares, the reliability of evidence on generation, diversion, and added costs has been highly disputed.

[4] Petitions for reconsideration of that decision are pending before the Board.

ability of discount fares and discontinue those which were unprofitable and/or ceased to meet the goals for which they were designed.

B. Eliminate the profit-impact test, but require the carriers to show that the discount fare would not result in a material deterioration in service for normal-fare passengers. With this as a standard, the carrier would need to demonstrate that the discount fare is not likely to impinge on the availability of seats for normal-fare traffic. This could result in more reliance on standby fares, capacity-control restrictions, or peak-period blackouts than is now the case. This standard could also be accompanied by an expiry requirement to allow periodic reevaluation of the fare.

C. Allow any new promotional fare to go into effect for a limited period of time, such as twelve months, regardless of profit impact. Upon application for renewal of a discount fare, a carrier would be required to demonstrate that the fare met the profit-impact test. This approach recognizes the difficulties inherent in deriving reliable generation/diversion ratios without the benefit of actual experience. The carriers would be expected to accumulate a body of data sufficient to provide a realistic basis for assessing the profit impact of the experimental fare. In order to avoid subjecting discount-fare filings to the profit-impact test required for renewal, however, carriers could try to turn an existing discount fare into a "new" proposal by making only minor changes to an existing discount.

D. Limit C above to promotional fares accompanying an award of new route authority. This approach would provide the wide pricing latitude needed to encourage rapid development of a traffic base for a new service. It also recognizes that meaningful generation/diversion ratios for particularly difficult to estimate when there is no prior experience in the market.

E. Retain the profit-impact test, and require discount tariffs to contain an expiration date, but shift the burden of proof in an initial filing to the complainant. The proponent carrier would have the burden of satisfying the profit-impact test if it wished to renew the fare. In administering the profit-impact test the Board would still be faced with the task of evaluating the reliability of the generation/diversion ratios and cost analyses submitted by the complainant.

F. Allow certain types of discount fares to be maintained without a showing that they meet the profit-impact test. The various discount fares would need to be categorized within a comprehensive consistent framework, and the Board would need to conduct a broad study of previous discounts to determine which ones were economic. While the establishment of a clearly defined discount-fare structure would alleviate public confusion and assure carrier management that tariffs matching the Board-approved design would not be suspended or investigated, the existence of a rigid structure might discourage innovative pricing. Also, discount fares which were profitable in one time period might not be profitable in a later period characterized by different economic conditions.

G. Retain the profit-impact test, but standardize the type of market research necessary to prove the generation/diversion ratio and provide guidelines on cost analyses. Specific comments on the types of analysis which prompt management to introduce or extend discount fares will be very useful to the Board in evaluating this alternative. Clear guidelines as to what constitutes adequate justification in support of discount tariff filings can minimize carrier burden, as well as simplify the Board's task of administering the profit-impact test. However, since discount fares are designed to meet a variety of market conditions it could be very difficult to determine a set of standards and guidelines which would be appropriate in all cases. Clearly defined standards could be adopted in conjunction with the approach outlined in C above. In this case only renewal filings would have to make a showing of favorable profit impact. The supporting data and the analytical effort required could be tailored to particular discount-fare proposals. A carrier would have been on notice since the fare went into effect that certain data would be required upon application for renewal.

H. Eliminate all noncost-based discount fares, and move instead toward greater use of peak and off-peak pricing. A basic problem with any standard for evaluating the effects of the discount fares offered at the present time is that those discount fares are uneconomic in the long run; the problem is one of differentiating between "good" below-cost fares and "bad" below-cost fares. The replacement of that kind of fare structure by greater use of peak and off-peak pricing, including seasonal and day-of-week pricing differentials, would tend to encourage more efficient operations in the long run and would direct price reductions at specific periods of excess capacity much more effectively than in alternative B. However, it may be difficult for a carrier to move in this direction so long as the noncost-based discounts, such as excursion, tour-basing, and group fares continue to be permitted. In connection with this alternative, the Bureau of Economics has recently completed a staff study into the relationship between peak and off-peak pricing and load factors. We are attaching this study as an appendix and invite comments on the study as well.

The Board wishes to reiterate that the foregoing list of alternatives is not intended to be exhaustive. Moreover, it is recognized that there are a number of possible variations in the alternatives depending on such factors as whether or not there should be an expiry requirement and how long such a requirement should be. The Board, after receiving comments from interested persons, will decide whether further proceedings in this matter are necessary and, if so, what further procedures should be utilized.

Interested persons may take part in this rulemaking by submitting 20 copies of written data, views, or arguments on the subjects discussed. All relevant material received by the dates shown at the beginning of this notice will be considered by the Board before taking final action on the proposed rules.

Individual members of the general public who wish to express their interest as consumers by informally taking part in this proceeding may do so by submitting comments in letter form to the Docket Section, without having to file additional copies.

(Sec. 204, 403, 404, and 1002, Federal Aviation Act of 1958, as amended; 72 Stat. 743, 758, 760, and 788, as amended; 49 U.S.C. 1324, 1373, 1374, and 1482; and 5 U.S.C. 552.)

By the Civil Aeronautics Board.

PHYLLIS T. KAYLOR,
Secretary.

DEMAND-PEAKING PROBLEM

A STAFF STUDY BY THE BUREAU OF ECONOMICS

I. *Background.* In Phase 6B of the DPFI, the Board determined that a standard load factor of 55 percent would be applicable for ratemaking purposes to the 48-State operations of the domestic trunk carriers.[1] Since the Board's adoption of this standard, the structure of the industry has changed markedly. The greatest changes have occurred on the supply side where fuel costs have skyrocketed and the efficient use of our finite fossil fuel resources has gained new prominence among our national priorities.

In recognition of these changes, the Board, on August 19, 1975, set down for reexamination the question of whether the current 55-percent standard remains reasonable. Specifically, the Board stated:

> We intend to reexamine the existing standards in terms of their relationship to both the level and structure of fares. Thus, the issues will include the overall load factor standard, the extent to which load factor standards should vary for different classes of service, and how the load factor standards should apply at varying distances. (PSDR-43, p. 2)

Pursuant to this investigation, a prehearing conference was held which resulted in the production of detailed daily service segment data for the mid month of each quarter during calendar year 1975 and the first half of 1976.

[1] See Orders 71-4-54 and 74-3-81.

This wealth of heretofore unavailable data both contradicts assumptions based on the best information previously available and provides fuel for a deeper analysis of the problem than would otherwise have been possible; indeed, the implications of the data go well beyond the limited load-factor issues and bear strongly on the overall industry pricing structure—including the discount fare structure.

To be more specific, the monthly service-segment data, which were available prior to this investigation, show that when individual flights are arranged according to their average load factors, a normal distribution is obtained. In other words, a bell-shaped curve emerges, indicating that most flights have load factors which are near the overall average and only a relatively few flights have very high or very low load factors. It had been assumed from this that were individual daily departures to be similarly arrayed, a normal distribution would also result. As may be seen from comparing Charts 1 and 2 on the following pages, this assumption proved to be false. There is a larger than expected number of full or nearly full departures. The data show further that this phenomenon is particularly pronounced during periods of peak demand. What this implies is that given the existing demand patterns, a significant increase in load factor would risk a sizeable increase in passenger rejection during peak periods. This will be developed more fully below.

A fresh look at the load-factor problem was undertaken with this newer, more detailed data in hand. Because demand peaking was found to be an important limiting factor on the degree to which load factors could be increased without greatly increasing the difficulty of obtaining a seat, some attention was directed toward determining:

Chart 1

FREQUENCY DISTRIBUTION OF DEPARTURES BY LOAD-FACTOR POINT
MONTHLY SERVICE-SEGMENT DATA
TRUNKS AND LOCALS

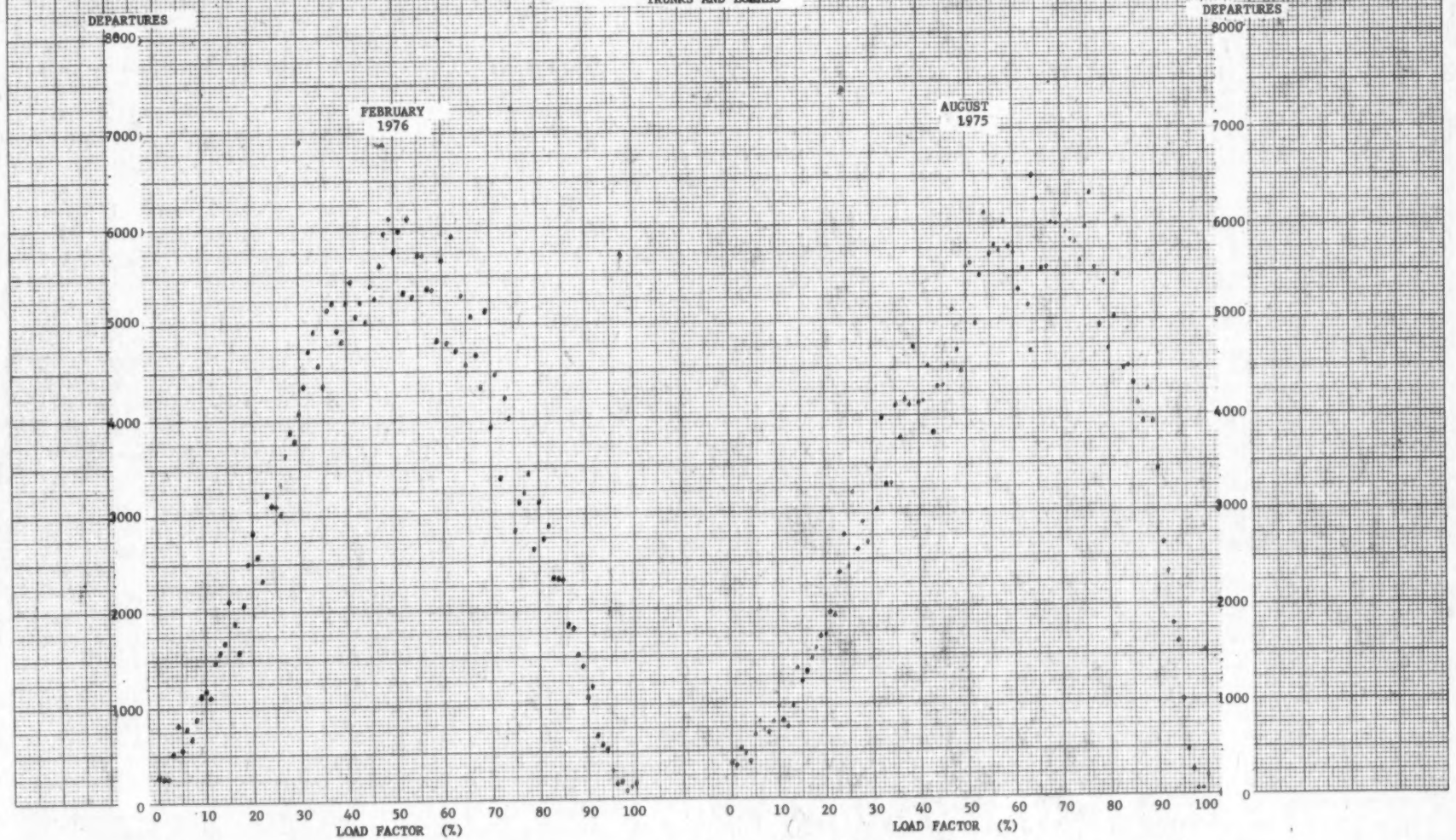
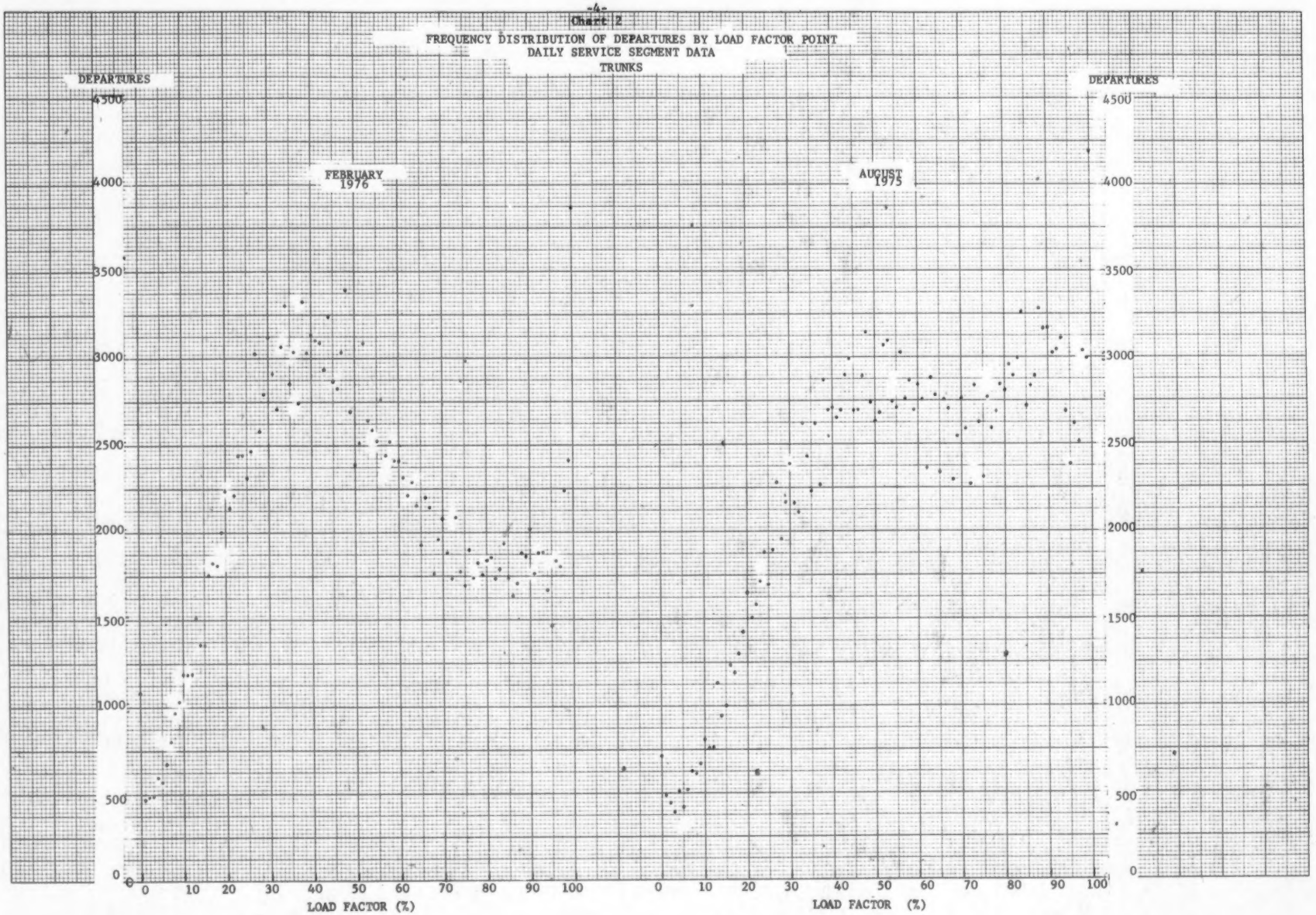


Chart 2

FREQUENCY DISTRIBUTION OF DEPARTURES BY LOAD FACTOR POINT
DAILY SERVICE SEGMENT DATA
TRUNKS



(a) Whether or not particular aspects of the current pricing structure tend to aggravate the peaking patterns, and

(b) Whether alterations in the current pricing structures could be designed to effectively reduce demand peaking.

This paper is an outgrowth of the analysis directed toward the load-factor problem but focuses primarily on the pricing implications which result therefrom.

II. *Demand peaking.* The demand for air transportation is characterized by intense peaking by month of year, by day of week, and by hour of day. This peaking is graphically illustrated in Charts 3 and 4. Revenue passenger-miles for August 1975 exceeded the level achieved during February 1976 by 29 percent overall and by 31 percent and 10 percent when coach and first-class service are considered separately. Peaking by day of week was also severe with revenue passenger-miles for Fridays (the peak day) exceeding those for Tuesdays by 27 percent. While coach traffic was seen to peak more strongly than first-class traffic on a monthly basis, the opposite is true by day of week where a 51 percent differential exists between first-class demand for the peak and valley days. The steepest traffic peaking of all occurs by hour of day. For example, during August and November 1975, and February and May 1976, revenue passenger-miles for departures between 1 p.m. and 7 p.m. were 24 times the level reported between 1 a.m. and 7 a.m.

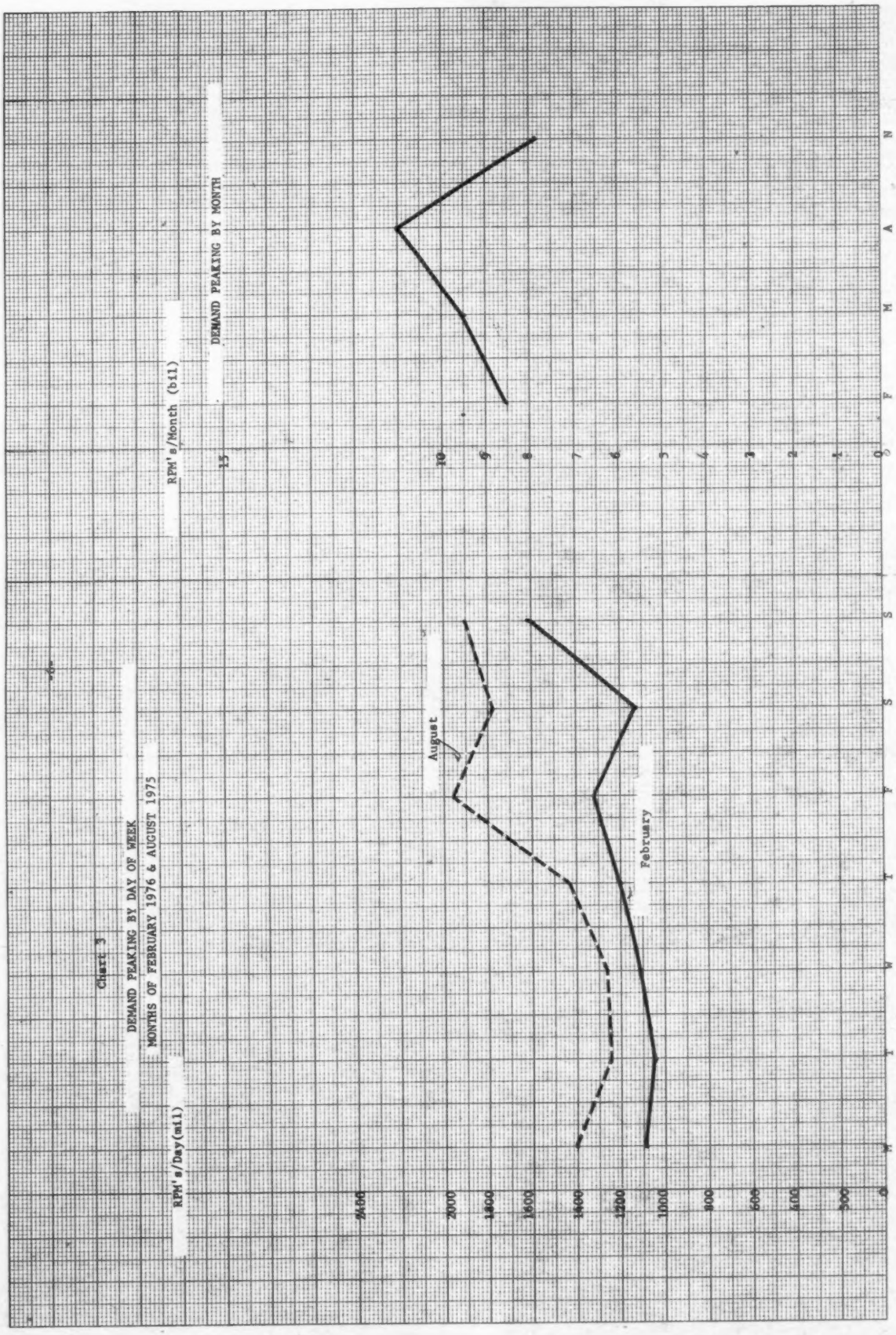


Chart 3
DEMAND PEAKING BY DAY OF WEEK
MONTHS OF FEBRUARY 1976 & AUGUST 1975
RPM's/Day(mil)
RPM's/Month (bil)
DEMAND PEAKING BY MONTH
August
February
Day of Week
M T W T F S S
J F M A M J J A S O N D

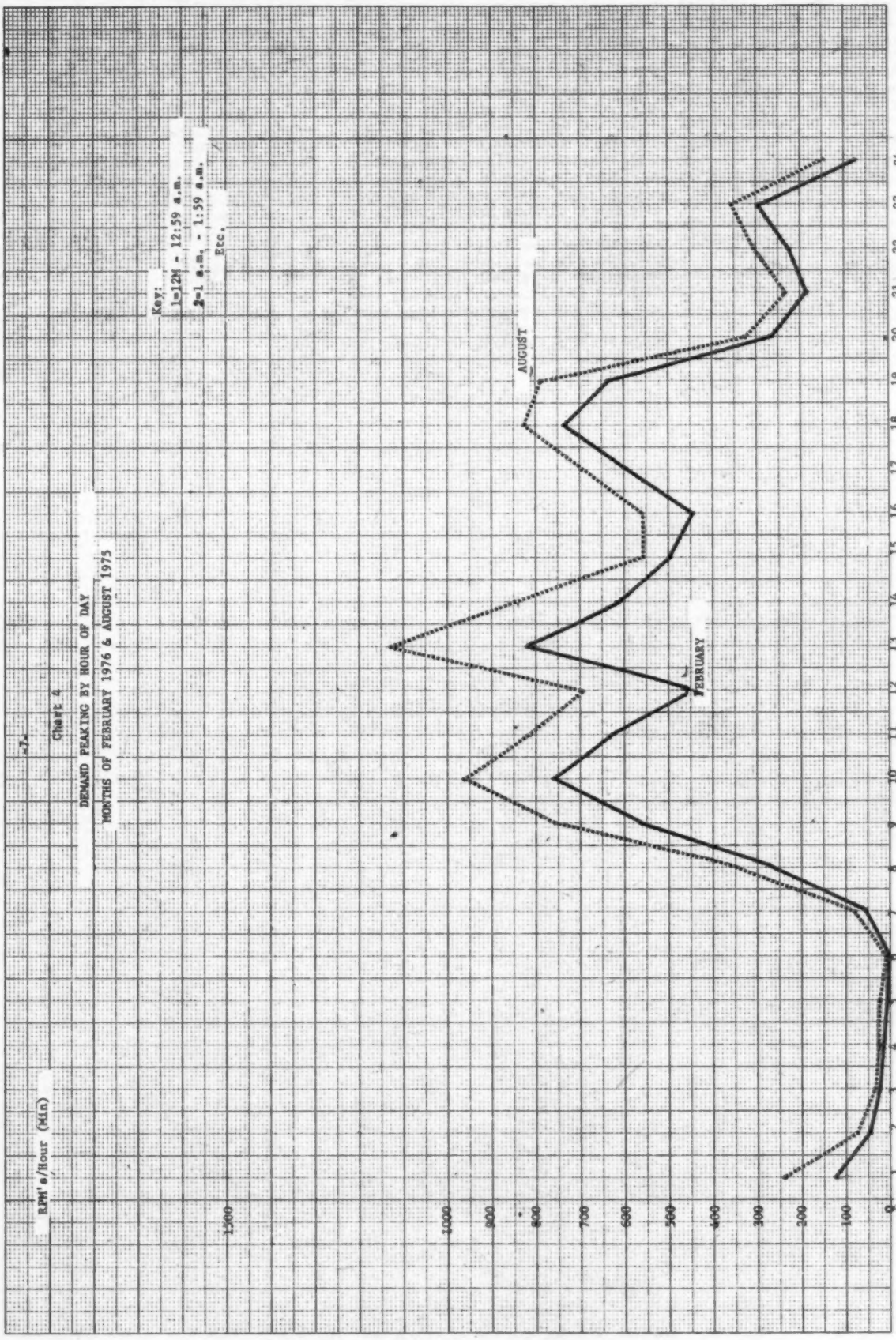

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Chart 4
DEMAND PEAKING BY HOUR OF DAY
MONTHS OF FEBRUARY 1976 & AUGUST 1975
Key:
1=12M - 12:59 a.m.
2=1 a.m. - 1:59 a.m.
Etc.
RPM's/Hour (Min)
1500
1000
900
800
700
600
500
400
300
200
100
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
HOUR
AUGUST
FEBRUARY

These monthly, daily, and hourly peaking patterns are remarkably consistent when broken out by carrier, by length of haul, by market density, and by number of competitors. While some differences do exist they are primarily differences in intensity rather than differences in the timing of the peaks and valleys.[2] (Appendix A consists of several Charts which illustrate this point.) For example, during August and November 1975, and February and May 1976, revenue passenger-miles for Fridays were 32.8 percent, 33.3 percent, and 47.6 percent greater than those for Tuesdays in the 300, 700, and 2,500 mileage blocks respectively.

The intense peaking of demand, as it currently exists has a substantial effect on load factors. High load factors occur during demand peaks and low load factors occur during demand valleys. For example, the average load factor for August 1975 (62.3 percent) was 18 percent higher than that for February 1976. Further, average load factor achieved on Fridays during August and November 1975, and February and May 1976, was 27 percent higher than that achieved on Tuesdays during the same period.

III. *The demand-smoothing approach.* As noted above, prior to receiving the detailed daily service segment data made available in the load factor investigation, it seemed reasonable to assume that since monthly flight load factors were normally distributed by load factor point, the same would hold true for daily load factors. (As Charts 1 and 2 above, graphically show, this assumption was proved to be false.) Thus, it was thought that a relatively small share of the daily departures were full or nearly full and that a moderate increase in the mean would result in only a minor increase in passenger rejection. The greater-than-expected dispersion of daily flight load factors from the mean causes some concern as to service levels which may result—particularly during peak periods—if the average load factor were to be increased substantially by a tightening of supply. During August 1975, for example 17.5 percent of all departures had coach load factors of 95 percent or more.[3] During Friday and Sunday (the peak days) this percentage increased to 23.2 and 23.8, respectively. Chart 5 illustrates this daily dispersion of load factors.

[2] This consistency, of course, would not hold true for each individual market.

[3] Another 13.2 percent of August departures had coach load factors in the 85–94 percent range.

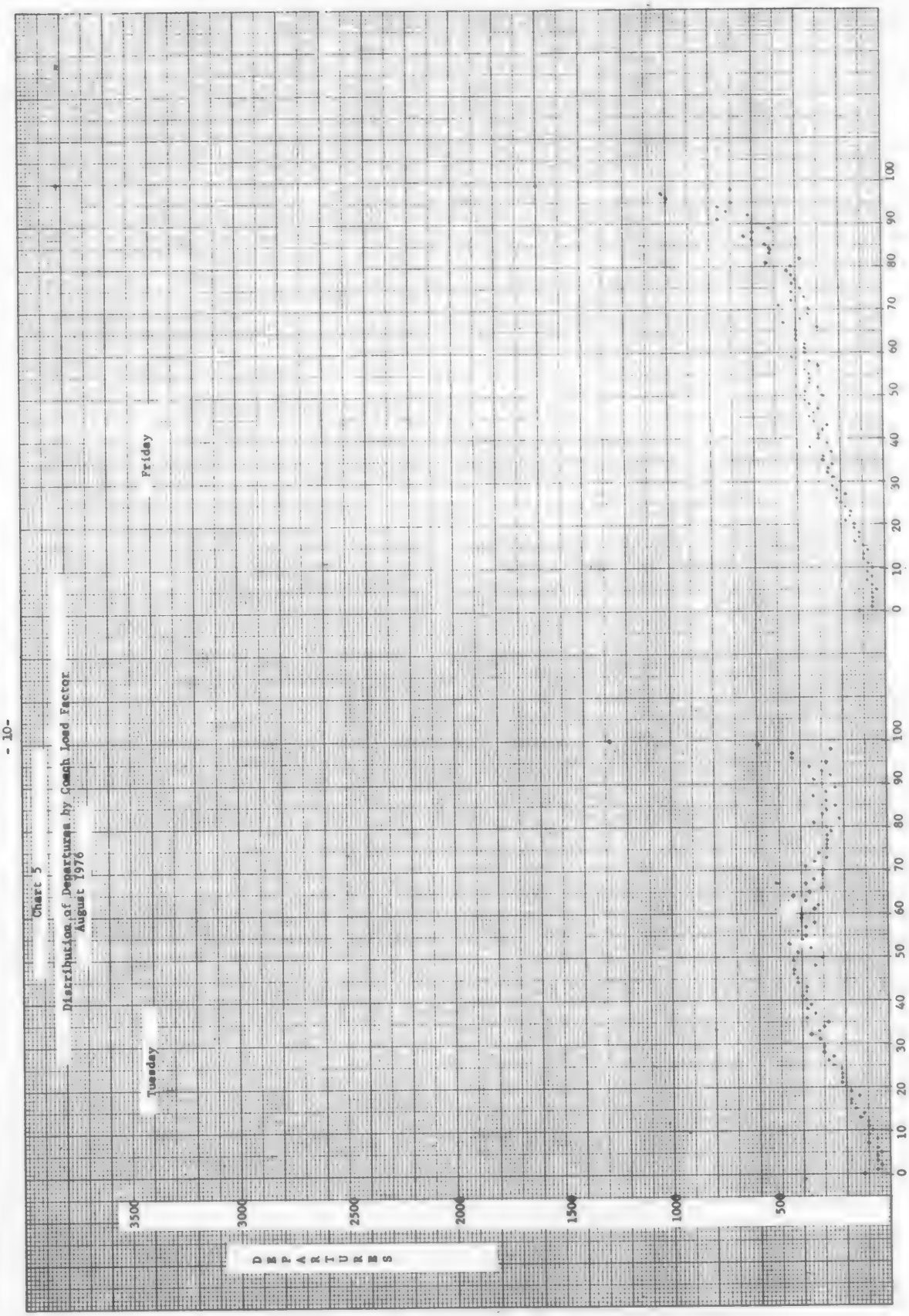


Chart 5
Distribution of Departures by Coach Load Factor
August 1976
Tuesday
Friday
DEPARTURES
3500
3000
2500
2000
1500
1000
500
0
10
20
30
40
50
60
70
80
90
100

The steepness or intensity of the monthly, daily, and hourly traffic peaking pattern, as it currently exists, provides an important limiting factor in the attainment of higher load factors. Capacity is geared, in large part, so that traffic rejection during peak periods will be minimized. Low load factors occur during demand valleys when capacity does not fall off as sharply as demand. It is clear that carriers have the ability to, and in actual practice, do vary the supply of air transportation in response to systematic variations in traffic. It is also clear, however, that the degree to which carriers fluctuate their supply falls far short of the degree to which passengers fluctuate their demand. For example, in February 1975 passengers limited their demand (RPM's) to only 66.1 percent of the August level, while carriers reduced their supply (ASM's) to 85.4 percent. Air Carrier Traffic Statistics data indicate that the failure of carriers to cut back February supply to the degree passengers cut back demand caused February load factors to be significantly below the yearly average in each of the last 5 years with the exception of 1974 when the fuel crises forced carriers to limit their supply.

Table 1

	February RPM's as percent of year ended February	February ASM's as percent of year ended February	Load factors (percent)	
			February	Year ended February
Year:				
1972	7.6	8.0	46.4	48.8
1973	7.4	8.1	47.7	52.3
1974	7.4	6.9	57.7	53.1
1975	7.0	7.8	48.6	54.4
1976	7.8	8.2	53.2	55.5

A similar situation exists by day of week. The difference between Friday (peak day) and Tuesday demand is much larger than the difference in supply.

Table 2

	Demand [1]		Supply [1]	
	Friday	Tuesday	Friday	Tuesday
Total: RPM's and ASM's (000)	5,447,056	3,900,907	9,756,196	8,638,488
Per departure (pax and seats)	71	58	121	121

[1] Data for the midmonth of each quarter 1975 as submitted by trunk carriers in this proceeding.

While some degree of capacity variation is clearly feasible, there are a number of factors which do limit carriers' scheduling flexibility. Perhaps the most obvious factor is the indivisibility of the aircraft unit. It is simply not possible to fly half an airplane during periods of slack demand, and, while aircraft vary in the number of seats they contain, substitution of aircraft is restricted by availability, union contracts, etc. Thus, the largest portion of supply variation stems from fluctuations in frequencies or number of departures. While, some load-factor improvement through greater scheduling fluctuations would be feasible, and would cause savings in certain elements of costs (e.g. fuel), aircraft utilization would suffer.

There is, however, a way of improving load factors and lowering costs without increasing peak-period passenger rejection and without requiring greater scheduling flexibility from the carriers. Although the systematic peaking of demand has exhibited a substantial limiting effect on load factors, this peaking pattern is not itself immutable. The rigorous application of rational peak and off-peak pricing could result in a more even flow of traffic, higher overall load factors, and lower overall fares. If demand fluctuations were reduced sufficiently to match supply fluctuations, the peak and valley load factors would be identical.

The question then arises: If the demand fluctuations which limit the control of load factor are themselves controllable, should not the load factor standard be based on the assumption that they will be controlled? I believe the answer to this is yes. The advantages of such an approach to the load-factor problem are essentially as follows:

(a) Since capacity is geared to peak demand, those consumers who cause the creation of peak capacity would, as a matter of equity, be asked to pay the cost associated with it.

(b) Consumers would be permitted to make the economic decision of whether or not the convenience of a peak-period flight is worth the added cost associated with the creation of peak capacity.

(c) The difference between peak and valley demand would be reduced to the extent the consumers opt for lower price over higher convenience.

(d) The reduction in the peak- and valley-demand differential would allow load factor to rise without increasing either the current degree of supply fluctuation or the level of peak-period passenger rejection.

(e) Average costs and fares would fall.

Peak and off-peak pricing is not entirely new to the airline industry. Perhaps the most notable experiment with demand-differential pricing is the night-coach fare. As Appendix B clearly shows, this form of off-peak pricing has substantially improved the demand and supply relationships where it is used.

The availability of some other forms of discount fares during peak periods, however, has served to aggravate the peaking problem. For example, Charts 6 and 7 illustrate the sharper peaking of discount traffic during the summer months when additional capacity is flown to accommodate the seasonal traffic surge. Further, while the availability of data with respect to discount-fare traffic by day of week is more limited, carrier filings made in Docket 21866–5 with respect to capacity-controlled excursion fares show that this discount-fare usage also tends to worsen the demand peaking problem by day of week—particularly in the long haul where usage of such fares represents a relatively important share of the traffic mix. (See Charts 8–12). While there is some tendency for these fares to alleviate the deep demand valley which occurs on Saturday in the short haul markets, the general peak-heightening effect of these fares is clearly shown.

CHART 6

DISCOUNT FARE TRAFFIC AGGRAVATES THE DEMAND-PEAKING PROBLEM

(BILLIONS OF RPM's)

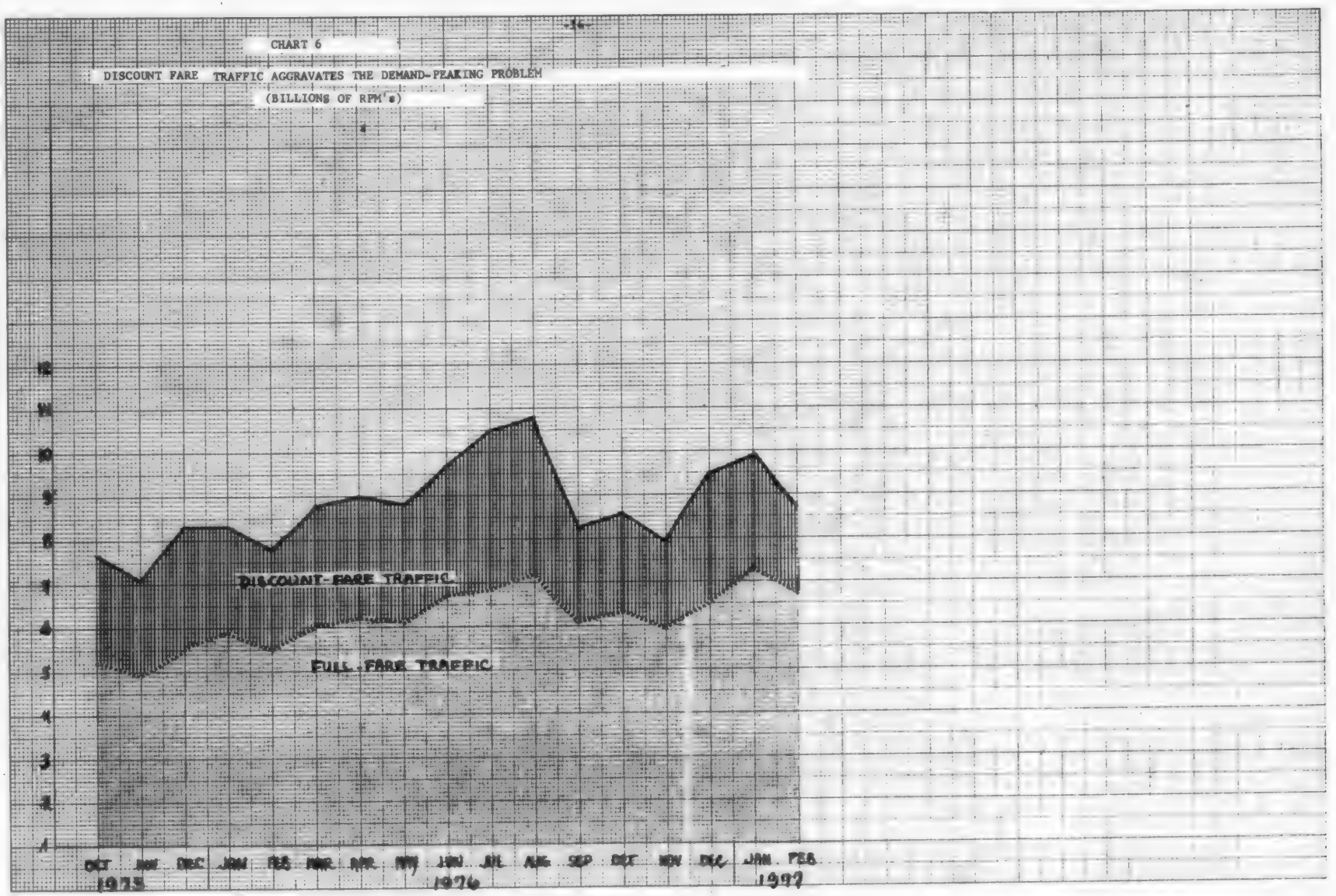
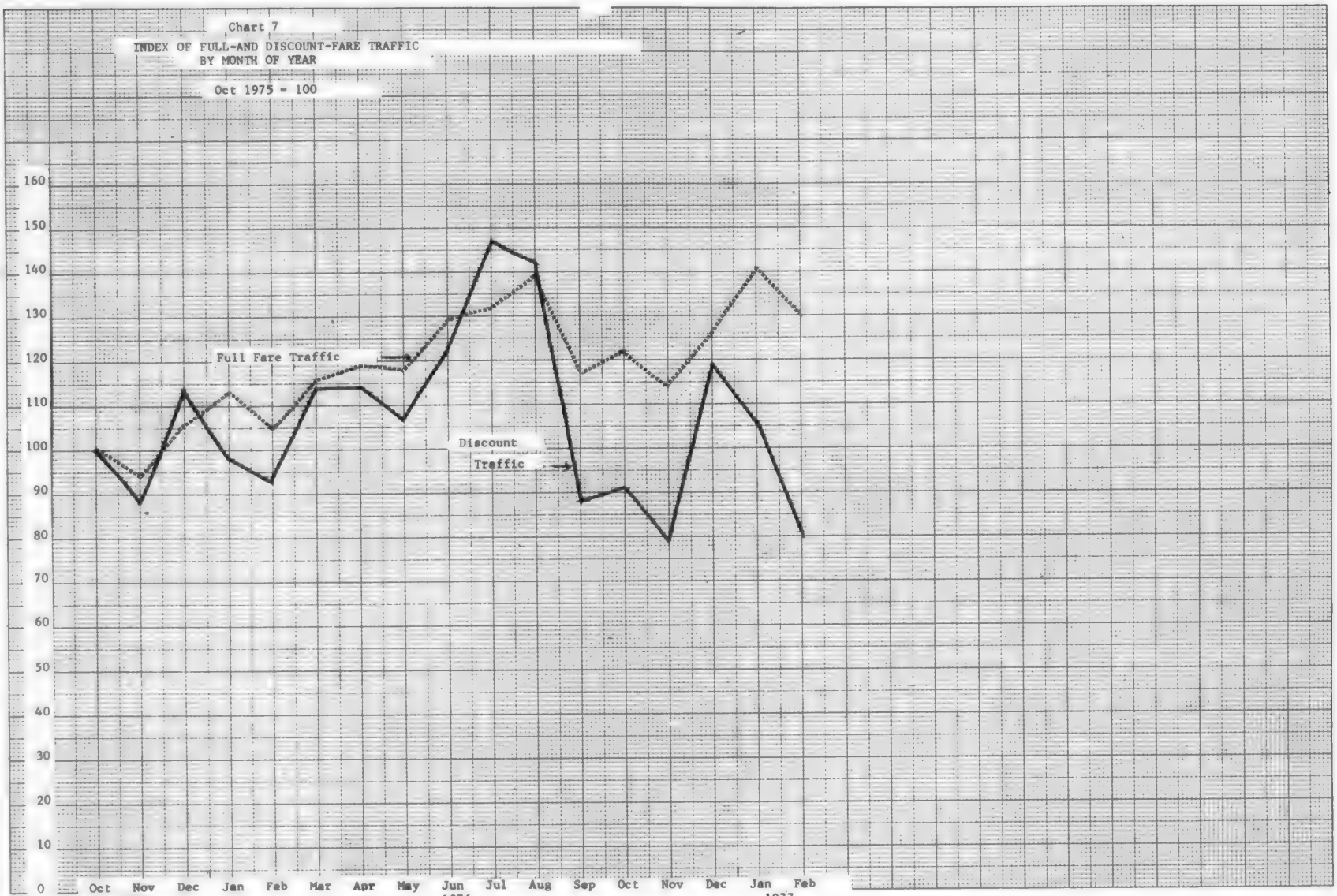


Chart 7

INDEX OF FULL-AND DISCOUNT-FARE TRAFFIC
BY MONTH OF YEAR

Oct 1975 = 100



Because, as discussed above, much of the peak-caused capacity remains during valley demand periods, any peak-period traffic generated by discount fares is costly traffic indeed. Thus, a fully systematized program of peak and off peak pricing would, of necessity replace the current system of peak-causing discounts. While such a system of demand-differenced full fares would vary substantially with time of travel, it would be both cost justified and relatively simple to administer when compared with the current plethora of discounts which include cumbersome requirements as to duration of trip, ground purchases, etc.

How much then, can load factors be improved by the smoothing of demand? While the precise answer is unknown, it is clearly quite a bit. For example, if monthly traffic volume could be smoothed perfectly and service quality levels maintained at the level offered in August 1975, annual load factors would average 62.3 percent—7.3 points or 13 percent higher than the current standard. Further, if daily peaks were also smoothed perfectly, it would be possible to increase the average to about 68 percent.[1] Peaking by time of day yields opportunity for further improvement.

Of course, it is unreasonable to expect any pricing technique to smooth peaks perfectly. The degree of demand smoothing which would result from such a pricing system is a function of the amount of the fare differentials put into effect and the price and service elasticities of passengers.

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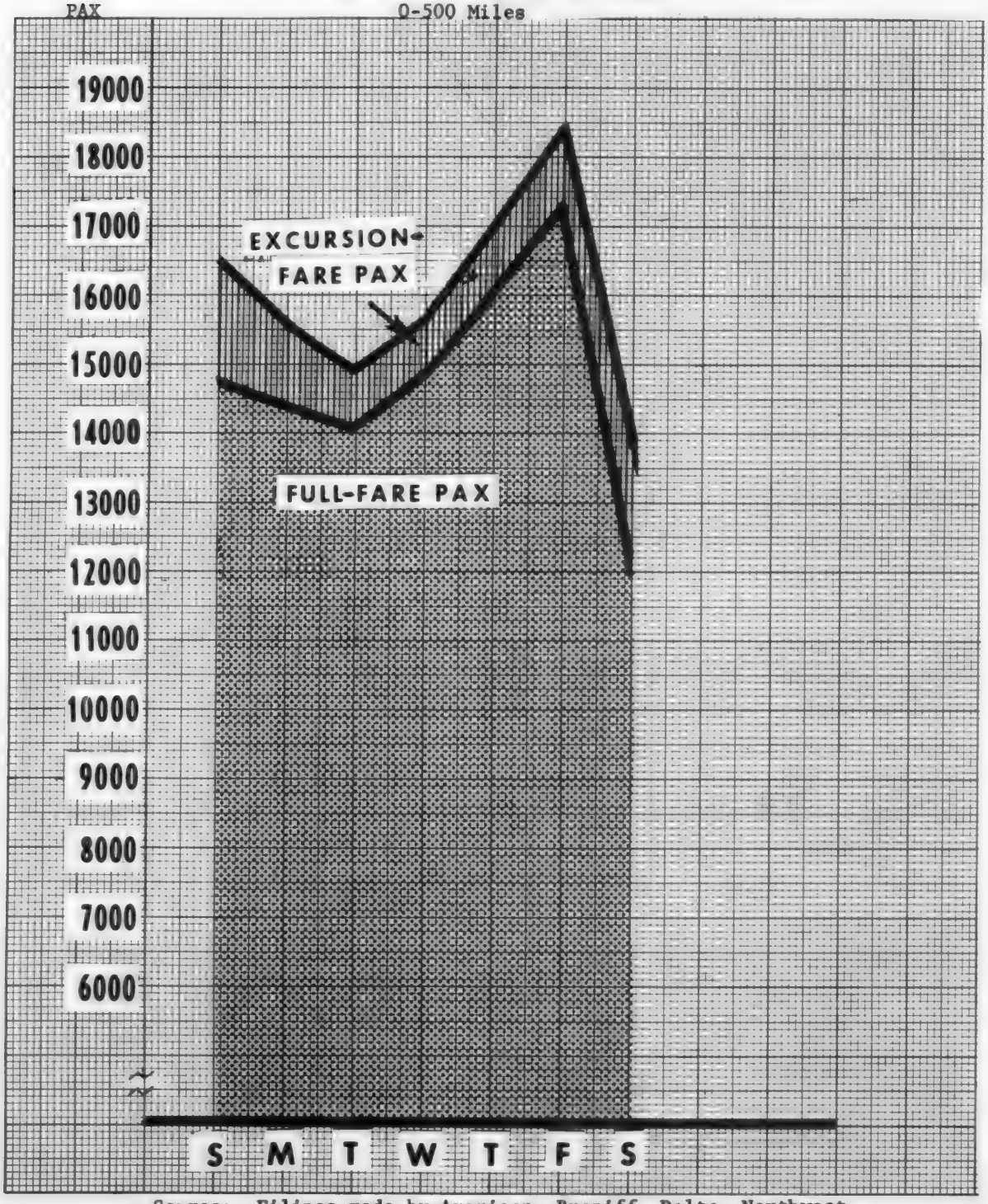
[1] Daily service-segment data supplied by the carriers shows that average load factors for Friday and Sunday in August 1975 were 67.6 and 67.9, respectively.

Chart 8
COMPARISON OF FULL FARE AND EXCURSION FARE PASSENGERS BY DAY OF WEEK
(WEEK ENDED August 14, 1976)



Source: Filings made by American, Braniff, Delta, Northwest, TWA, United and Western in Docket 21866-5

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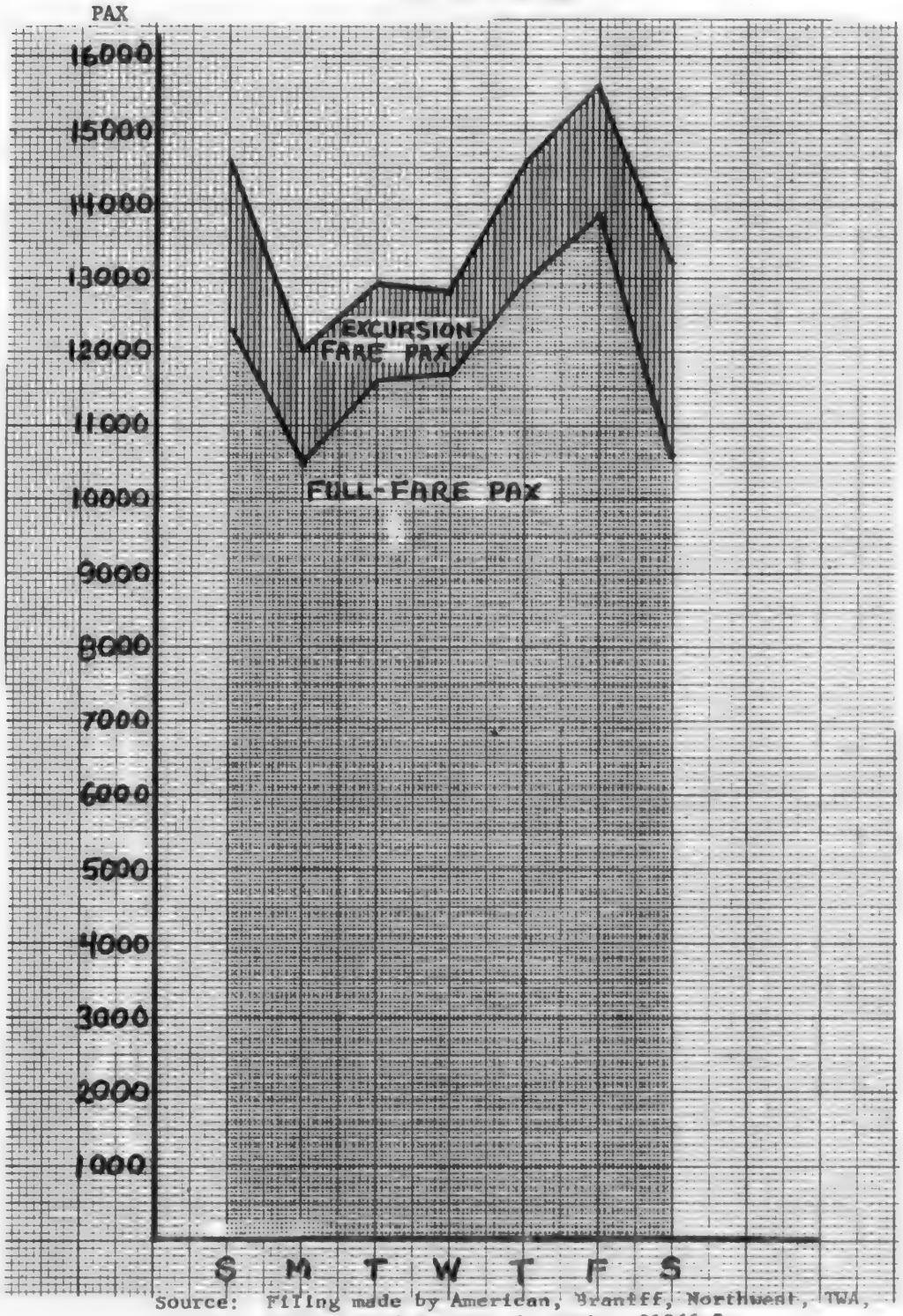
Chart 9

COMPARISON OF FULL-FARE AND EXCURSION-FARE PASSENGERS BY DAY OF WEEK

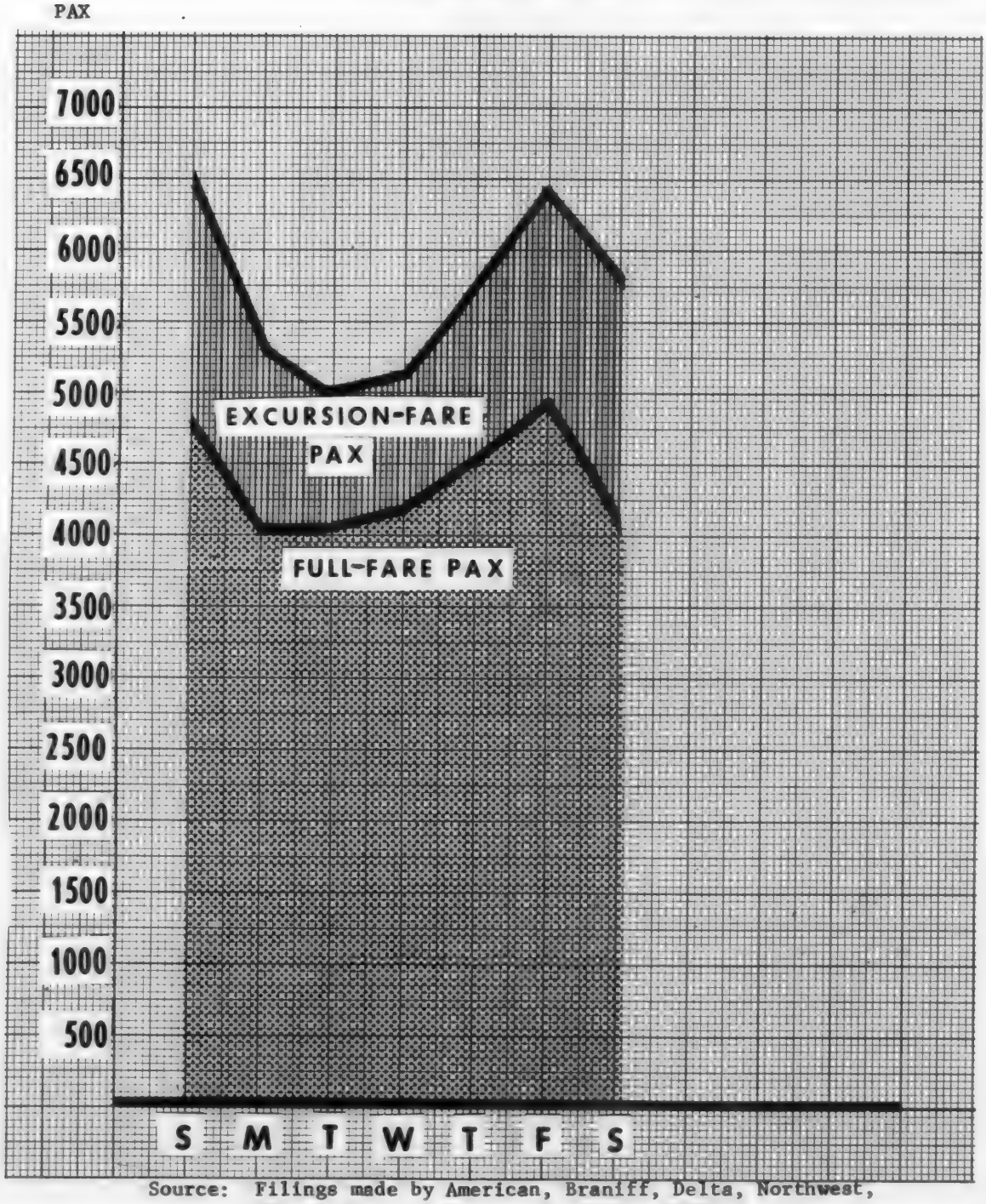
(WEEK ENDED August 14, 1976)
501-1000 Miles



Source: Filing made by American, Braniff, Northwest, TWA, United, and Western in Docket 21866-5

Chart 10
COMPARISON OF FULL FARE AND EXCURSION FARE PASSENGERS BY DAY OF WEEK

(WEEK ENDED August 14, 1976)
1001-1500 Miles

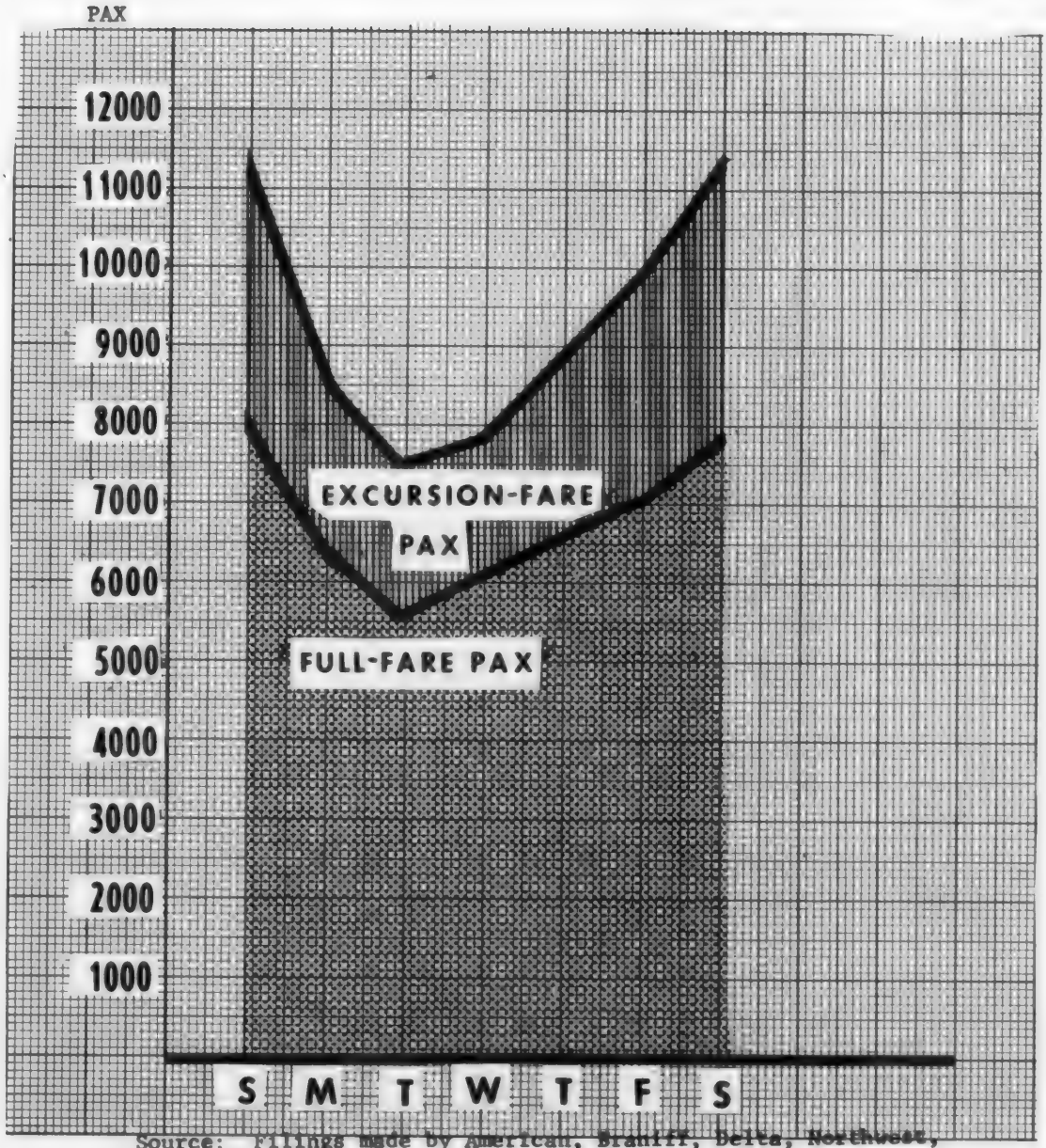


Source: Filings made by American, Braniff, Delta, Northwest, TWA, United and Western in Docket 21866-5

-20-
Chart 11

COMPARISON OF FULL FARE AND EXCURSION FARE PASSENGERS BY DAY OF WEEK

(WEEK ENDED August 14, 1976)
1501-2000 Miles

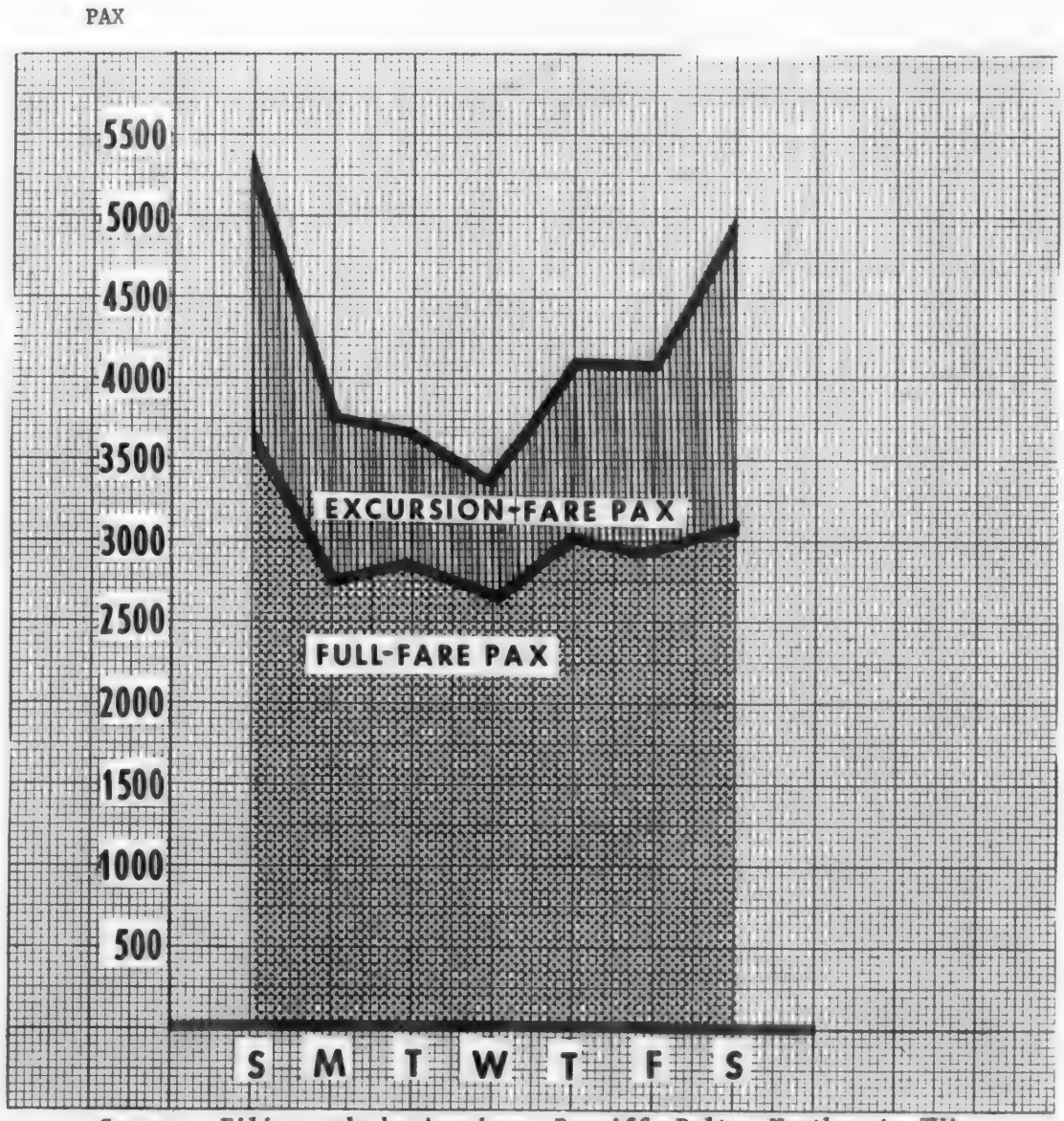


Source: Filings made by American, Braniff, Delta, Northwest, TWA, United and Western in Docket 21866-5

Chart 12

COMPARISON OF FULL FARE AND EXCURSION FARE PASSENGERS BY DAY OF WEEK
(WEEK ENDED August 14, 1976)

2001 Miles and Up



Source: Filing made by American, Braniff, Delta, Northwest, TWA, United and Western in Docket 21866-5

How then can prices be structured to reduce the demand variations? The monthly, daily, and hourly traffic peaks suggest a three-tier pricing structure. The following formula has been designed to develop demand-differential fares with the aim of smoothing daily peaks.[5]

OFF-PEAK FARE

$$OPF = VC + (CC \times PLF)$$

PEAK FARE

$$PF = VC + \frac{CC(AS_{f,\,s_{ii}} + [AS_{m,\,t,\,w,\,f,\,s_{ii}} - (AD_{m,\,t,\,w,\,f,\,s_{ii}} \times PLF)])}{AD_{f,\,s_{ii}}}$$

Where:
VC=variable cost per passenger
CC=capacity cost per seat
AD=actual demand (passengers per day)
AS=actual capacity (seats per day)
PLF=peak load factor, and subscripts m, t, w, f, f_1 and s_{ii}=day of week

This formula is based on the premise that were demand flat rather than peaked, carriers could maintain throughout the week the load factor which they now achieve during the two peak days. Each passenger then is charged a fare sufficient to cover costs at this peak load factor. In addition, since it is assumed that the remaining capacity would not exist but for the peaking of demand, peak-period customers are asked to pay the cost associated with this capacity. In other words, peak-period customers would pay both the cost of capacity at the peak and the cost of that off peak capacity which is above the amount required to produce the peak period load factor.

Thus, the greater the excess capacity during off-peak periods, the greater the difference between peak and off-peak fares; and the greater the fare differential, the more incentive there will be for consumers to shift demand patterns and smooth the peaks. The process should be viewed as iterative. In other words, the peak and off-peak differentials may have to be adjusted from time to time in order to achieve the desired smoothing of demand, while avoiding the creation of new peaking problems. Imposition of fares based on the above formula should be expected to alter demand patterns substantially. However, the chance that peak and off-peak fares developed at first will be in precisely the right proportion for optimal demand smoothing is miniscule indeed.

To give an idea of how such a pricing system could work, illustrative fares have been worked out for 700-mile trip length. See Appendix C. The resulting seasonal and daily peak and off peak fares are shown on Table 3 below.[6]

Table 3

	Average costs fare/pax	Percent of average for trip length
700-Mi trip	$62.52	100.0
Peak season	72.84	116.5
Peak days	80.20	128.3
Offpeak days	68.80	110.0
Offpeak season	58.14	93.0
Peak days	66.84	106.9
Offpeak days	53.73	85.9

While the changes in traffic patterns which would result from such differentials cannot be measured with precision, if we assume an elasticity of −0.7 and and if we assume further that the peak-period load factor will be maintained we can estimate an 11-point load-factor improvement which could be obtained from such a pricing estimate. See Appendix D. This estimate of changing traffic patterns may be viewed as conservative for the following reasons:

1. While, some discounts are currently blacked out during peak periods, those that are available logically (and as demonstrated by Charts 6–12 supra) receive their heaviest usage at the peak. The impact on customers using peak-period discounts would presumably be greater than the calculations indicate.

2. A simple elasticity calculation does not adequately reflect the passenger shifting between available departures when these departures are differentially priced. Pleasure travelers will be more likely to shift their travel time than will business travelers. While, there is currently no adequate measure of the amount of demand shifting which will occur under peak and off-peak pricing; the likelihood and substantial peak smoothing from such pricing techniques is heightened, since, pleasure travelers are found in relatively large concentrations on peak days of the week.

3. Since, as will be discussed below, there is some indication that the elasticity for price decreases is greater than for price increases, the traffic smoothing effect of simultaneous price increases and decreases when calculated on the basis of an undifferentiated elasticity coefficient is probably understated.

4. No allowance has been made for the peak smoothing effect which could be obtained from peak and off peak pricing by time of day.

On the other hand, the calculations do not take into account the degree of traffic variation within peak or off-peak periods and the degree which may exist after implementation of peak and off-peak pricing. Nor do they take into account possible differences in elasticity by day of week and month of year due to differences in traffic mix.

On balance, we believe that a load-factor improvement of between 5 and 10 percent would be reasonably attainable from the demand-smoothing techniques discussed herein with no significant increase in peak-period passenger rejection. Implementation of these pricing techniques with no change, or a smaller change in the current load-factor standard may be expected to result in substantially improved peak-period service quality. In other words, while the average annual load factor would remain about the same, there would be fewer empty seats in valley demand periods, but greater seat availability during the peaks. Further, whatever the load-factor standard, its achievement could be attainable with less scheduling fluctuations than under the current pricing patterns, thus easing the attainment of higher utilization of resources.

It should be emphasized, however, that peak smoothing through demand differential pricing should not be expected to occur overnight. Given the profusion of fares now available to the traveling public and given the diversity of the traffic mix, it will not be possible to calculate a truly optimum schedule of peak and off-peak fares without some testing in the market place. Thus, provision must be made for adjustment to any such pricing scheme when its almost inevitable flaws become visible. Further, should a revised load-factor standard be adopted based on such pricing changes, that standard should be phased in over a period of time sufficient to allow the demand smoothing to be realized. Assuming an increase in the current 55-percent load-factor standard of 5 points, sizeable effects should be anticipated over and above the smoothing of traffic flows.

Of course, implementation of a systematic schedule of peak and off-peak fares such as that discussed above would represent a drastic change in the current overall pricing structure of the industry. The obvious question arises: Can the benefits of demand smoothing be achieved by a less sweeping overhaul of the fare structure? The answer is yes, but to a far more limited extent. While, the current system of discount fares has been shown to worsen demand peaking, conditions or requirements which would eliminate the application of such fares during peak demand periods would tend to ease the intensity of the peaking. Unless or until a systematized program of peak and off-peak pricing is implemented the effect which particular discount fares will have on traffic flows during peak and valley periods should be an important factor in determining the reasonableness of such fares. This would at least limit the degree to which such fares are allowed to lower service quality to full-fare passengers during peak periods, and lower overall load factors and/or utilization rates.

IV. *Effect of higher load factor.* Since an important benefit attainable through the demand-smoothing effects of peak and off-peak pricing is increased load factor, the effects of such a load-factor increase are relevant in the consideration of the pricing policies discussed in this paper. An increase in the current

[5] The same formula with different subscripts, of course, would be used to develop monthly and hourly fare differentials.

[6] Hourly fare differentials were also computed, but, as stated in Appendix C, the data base appears inadequate for determination of relevant hourly fare differentials.

55-percent standard from 55 percent to 60 percent[7] would have a marked effect on fare level, traffic volume and fuel consumption.

V. *Effect on traffic.* A 5-point increase in the overall ratemaking load-factor standard would result in an 8.24-percent reduction in capacity costs. In other words, instead of paying for 1.82 seats as is now the case, the passenger on average would be asked to pay for only 1.67 seats. At the current level of operations, this would result in an average fare decrease of about 5.5 percent. If we assume the Board's −0.7 elasticity, therefore, a 4-percent overall traffic increase would be estimated.

Serious question exists, however, as to the adequacy of this estimate in this instance. Whether or not the −0.7 elasticity reasonably approximates the traffic effect of across-the-board fare increases question remains as to whether the elasticity for price increases is the same as that for price decreases.

This question is particularly pertinent when it is recommended that the load-factor improvement proposed be attained through peak and off-peak pricing techniques. Under demand-differential pricing there would be no across-the-board fare change, but rather simultaneous fare increases at peak periods and fare decreases during off-peak periods.

In view of the above, elasticity regressions were run in an attempt to answer the question: Is the elasticity for fare increases the same as that for fare decreases? In other words, will all traffic attracted by price decreases dry up when fares are raised. Logic dictates that some traffic attracted by low fares will remain even if fares are increased. The results of the regressions support this logic. (See Table 4). They indicate an overall average elasticity of −0.8, but elasticities of −1 for price decreases and −0.5 for price increases. It is likely, therefore, that a traffic change estimate based on a −0.7 elasticity will be understated. The impact on traffic of a 5.5-percent fare increase assuming elasticities of −0.7, −1.0, and −1.3 is shown below.[8]

TABLE 4.—*Summary of elasticity regressions*

Observations (n)[1]	80	80	80
R^2	0.690	0.692	0.692
Standard error of estimate	0.026	0.026	0.026
F—ratio	18.746	15.120	15.120
Durbin-Watson	1.402	1.406	1.406
Coefficients and (standard errors): Yield	−0.8073 (0.1431)	−0.9779 (0.2378)	−0.5459 (0.3241)
Dummy (price increases)		0.4321 (0.4807)	
Do			−0.4321 (0.4807)
GNP	0.4070 (0.4460)	0.3221 (0.4565)	0.3221 (0.4565)
GNP (lag)	0.8978 (0.4427)	0.9859 (0.4540)	0.9859 (0.4540)
Trend	−0.0115 (0.0073)	−0.0121 (0.0073)	−0.0121 (0.0073)
Y—intercept	0.0327	0.0301	0.0301

[1] Quarterly differences for calendar years 1955–75.

Fare decrease	Assumed elasticity	Traffic increase
Percent		
5.5	−0.7	4.0
5.5	−1.0	5.8
5.5	−1.3	7.7

Of course, under a system of peak and off-peak pricing an additional impact on traffic flows may be expected. That is, some passengers who would continue to fly at a higher fare if no other option were available to them may choose to alter their trip plans, if to do so will save them money. While this effect will not change the overall level of traffic it will change traffic flows.

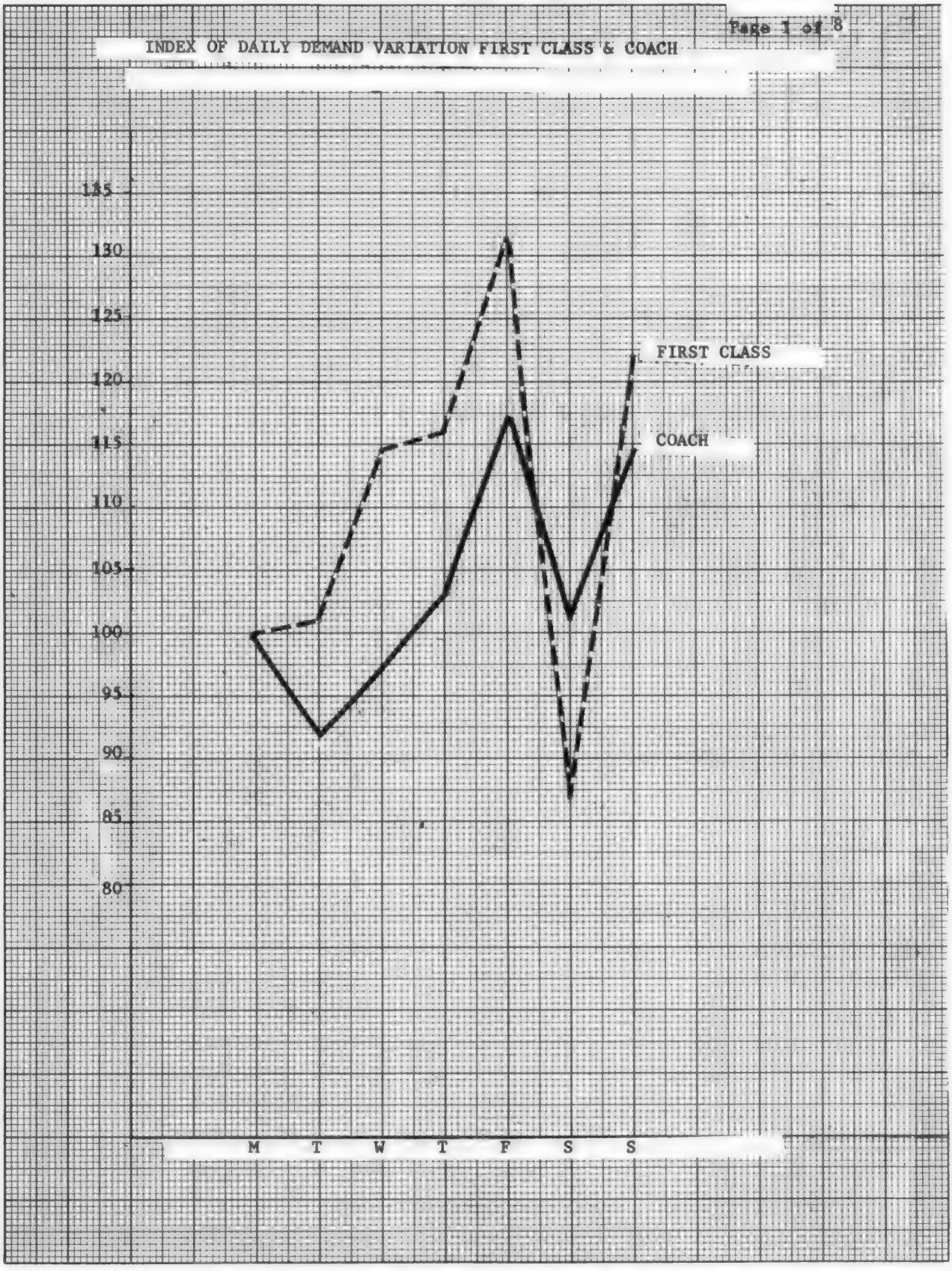
VI. *Effect on service.* The impact of the recommended increase in load-factor standards on service levels will, of course, depend upon the ultimate impact on traffic. The 5-percent increase in load factor implies an 8.3-percent decrease in available seat-miles when no allowance is made for traffic increases. With traffic increases at the above levels of elasticity of 4 percent, 5.8 percent, and 7.7 percent, reductions in capacity of 4.7 percent, 3 percent, and 1.3 percent are implied. Again, no provision has been made for normal traffic growth. During the year ended December 31, 1976, total domestic trunk RPM's increased 10 percent. Growth of this magnitude would eliminate the need for capacity reductions. The true effect on service would then be a limiting of the amount of increased capacity to a level significantly below what would otherwise occur.

VII. *Effect on fuel consumption.* The effect of a 60 percent standard on fuel consumption would depend both on traffic changes and on the schedule and service changes made by carriers. During 1975, fuel consumption averaged 29.76 gallons per thousand ASM's. (See Appendix E). If we assume that this figure would remain after any adjustments in schedules, fuel consumption per thousand RPM's would be reduced from 54.12 gallons to 49.61 gallons, or by 8.3 percent. Unless we assume no traffic effect from the increased load factor standard and a zero-growth rate, the total reduction in fuel usage will, of course, be less than 8.3 percent. However, there can be little doubt that the fuel which is consumed will be used more efficiently in that more transportation value will be supplied per unit of fuel. Further, it may be assumed that some portion of the additional passengers who may be attracted to air travel by lower fares otherwise would have traveled by different means. Therefore, to the extent existing capacity is filled by diverted traffic, fuel savings will be realized.

[7] As stated above, a load-factor increase of between 5 and 10 percent appears attainable, therefore, the effects discussed here may be deemed conservative.

[8] The −0.7 elasticity is the Board's determination of the appropriate elasticity for ratemaking purposes. The −1.0 elasticity is the result of the elasticity regression discussed above and the −1.3 elasticity is representative of the Bureau's position in Phase 7 of the DPPI.

APPENDIX A—DEMAND PEAKING BY DAY OF WEEK



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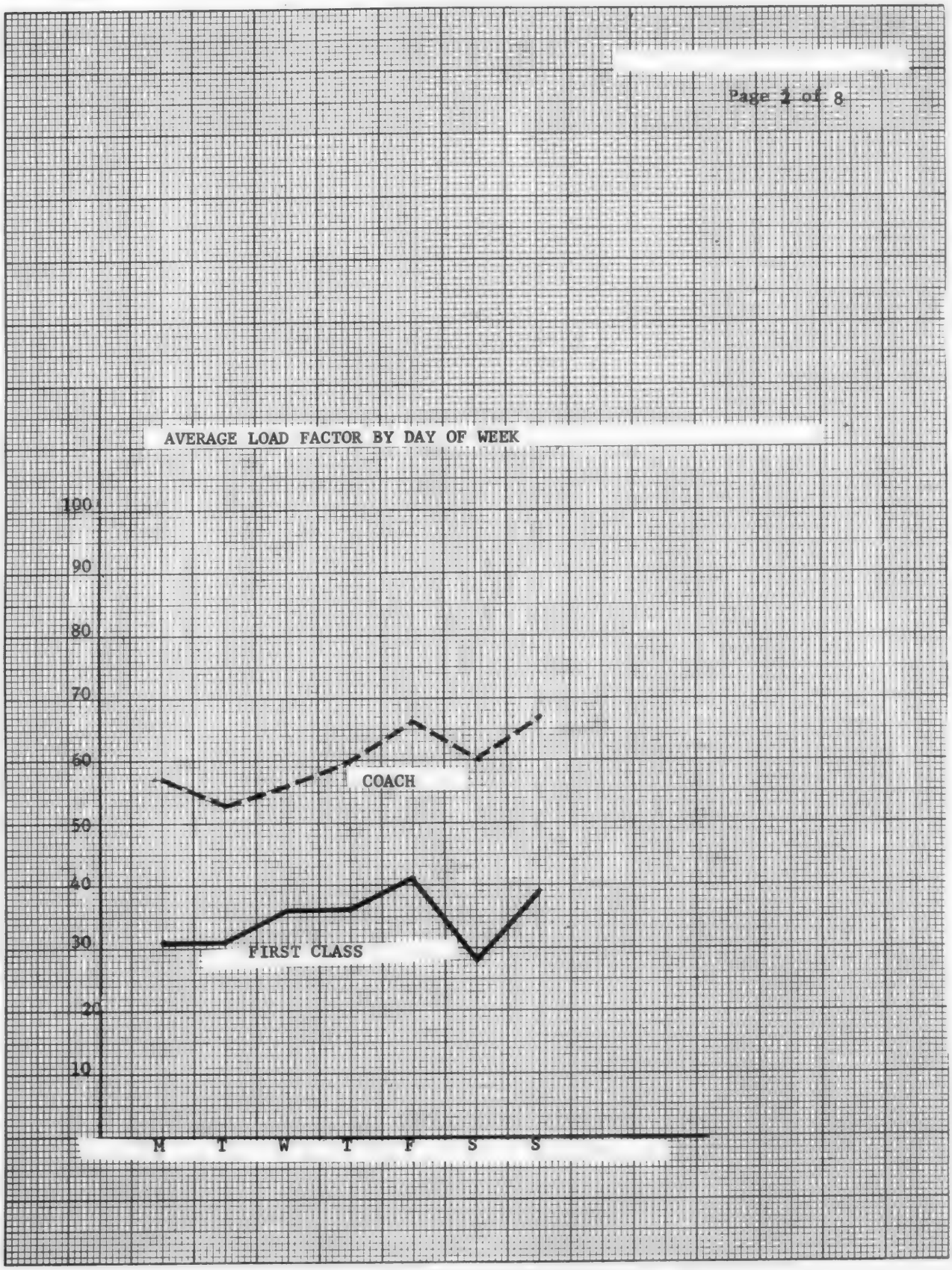
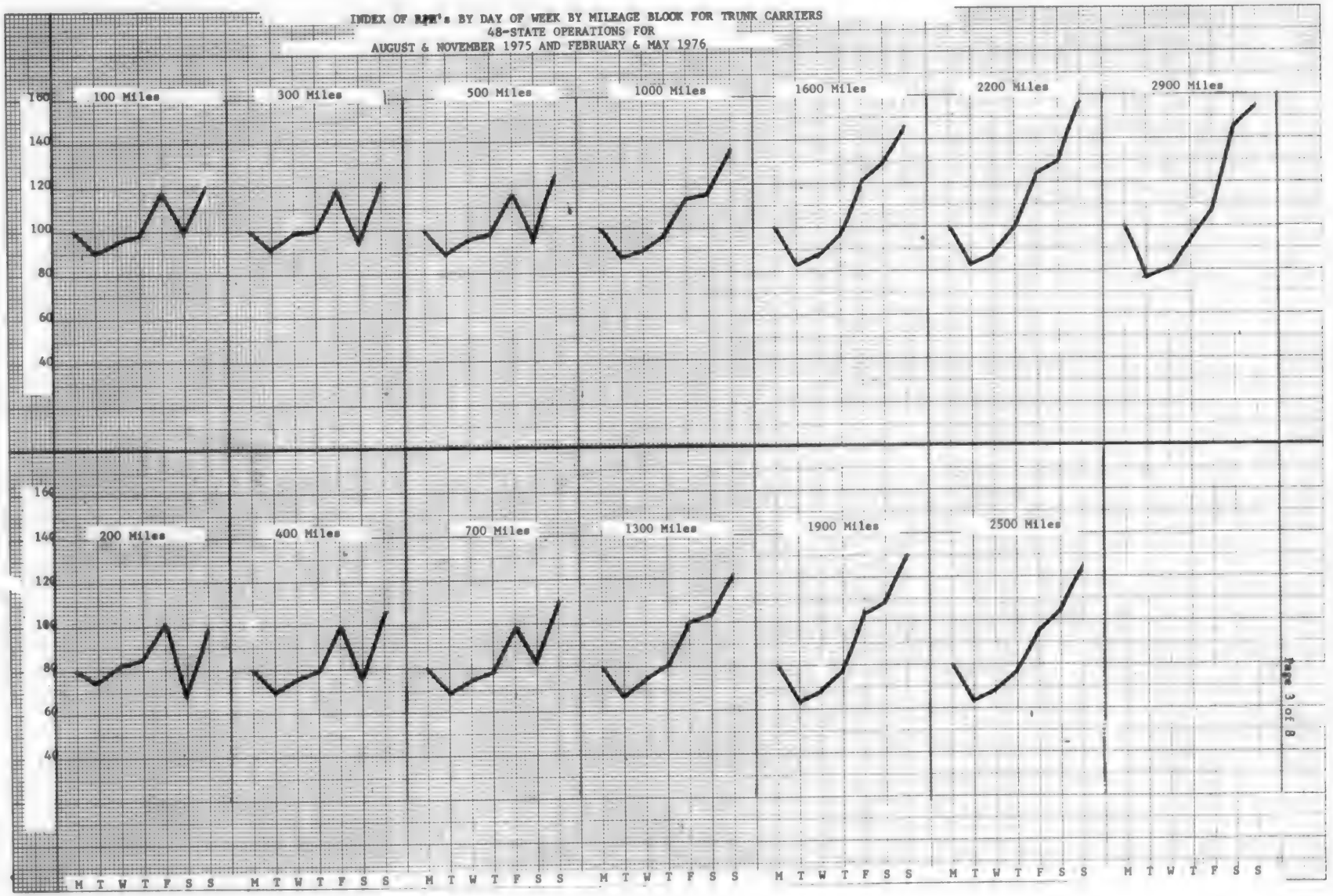
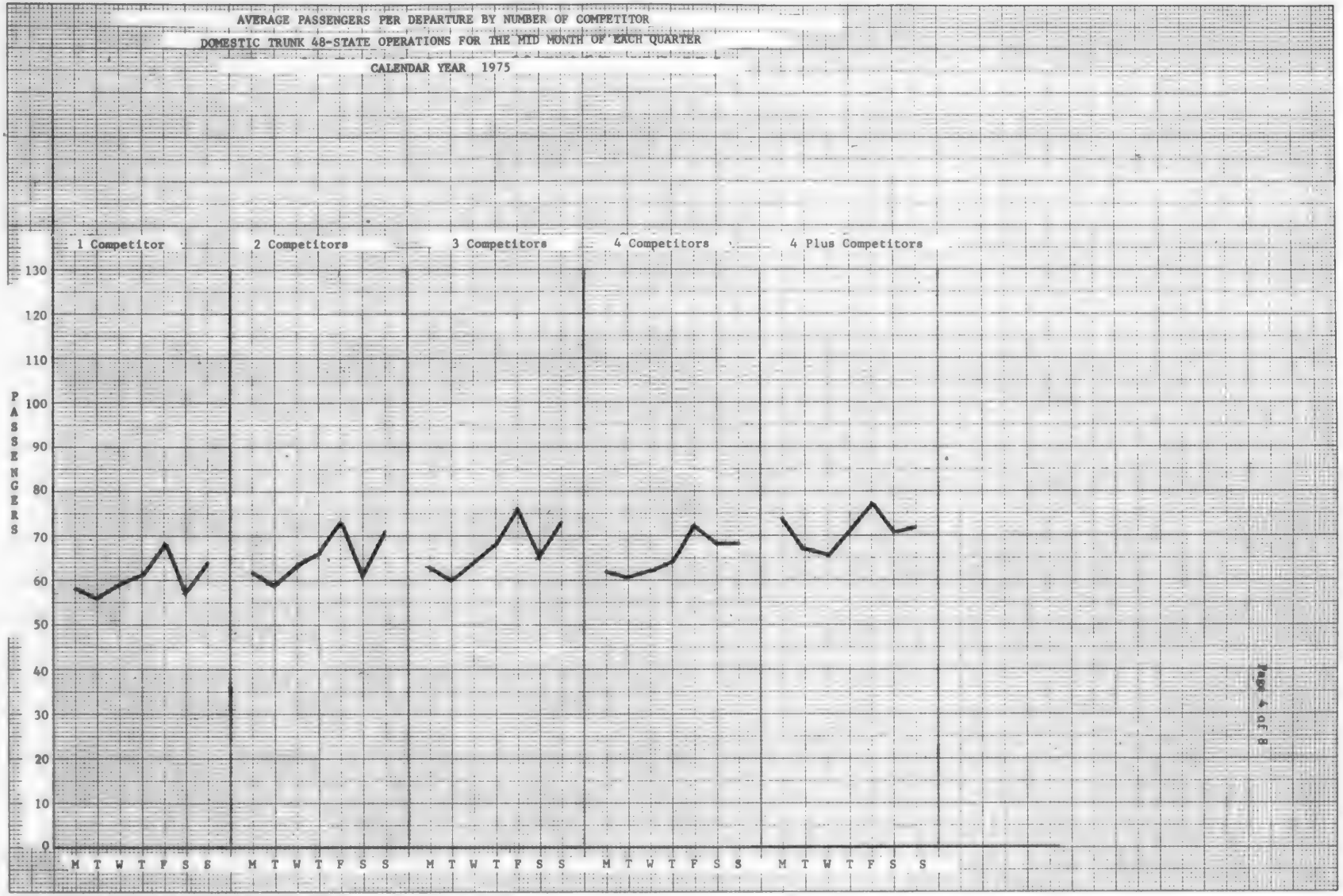
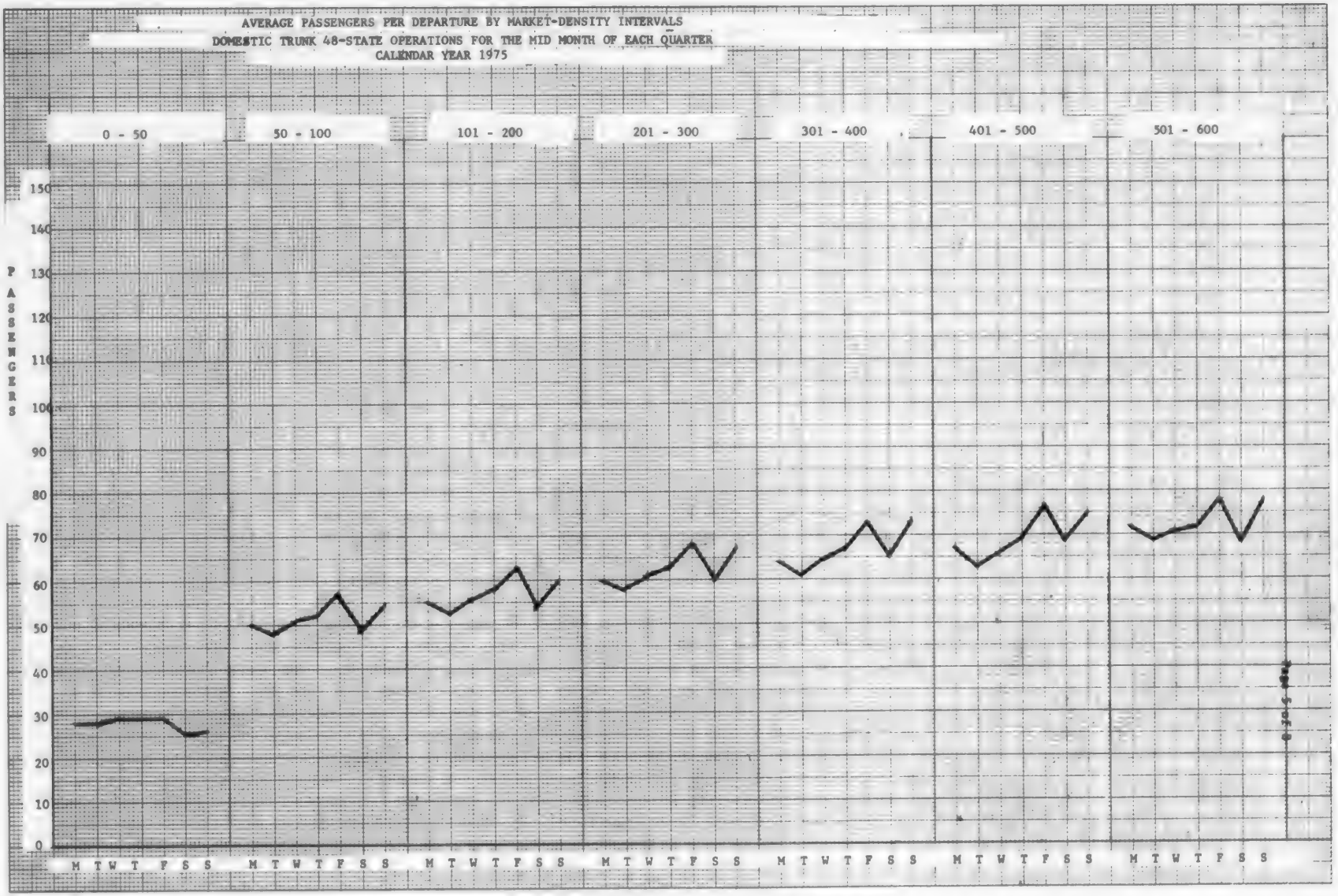
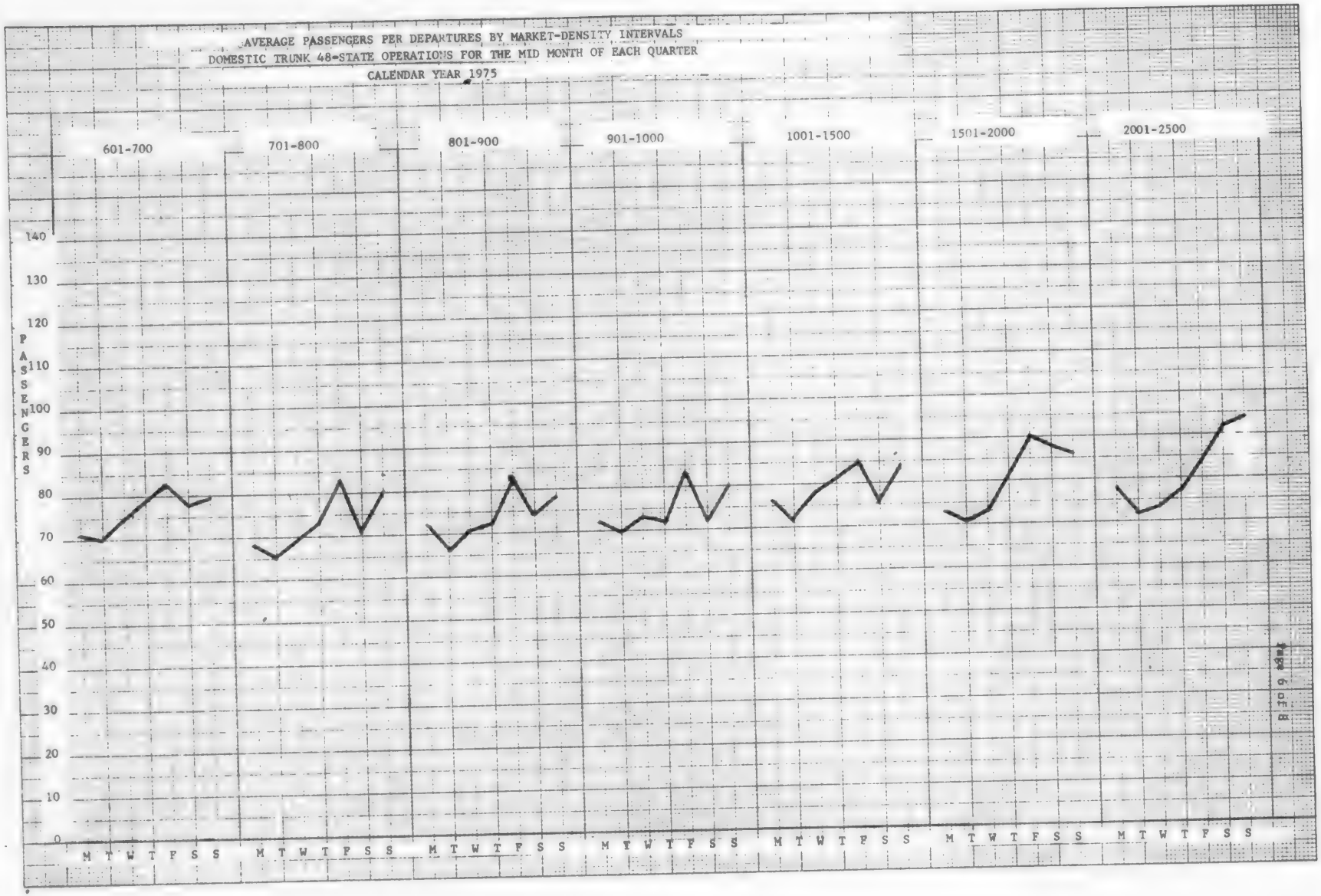
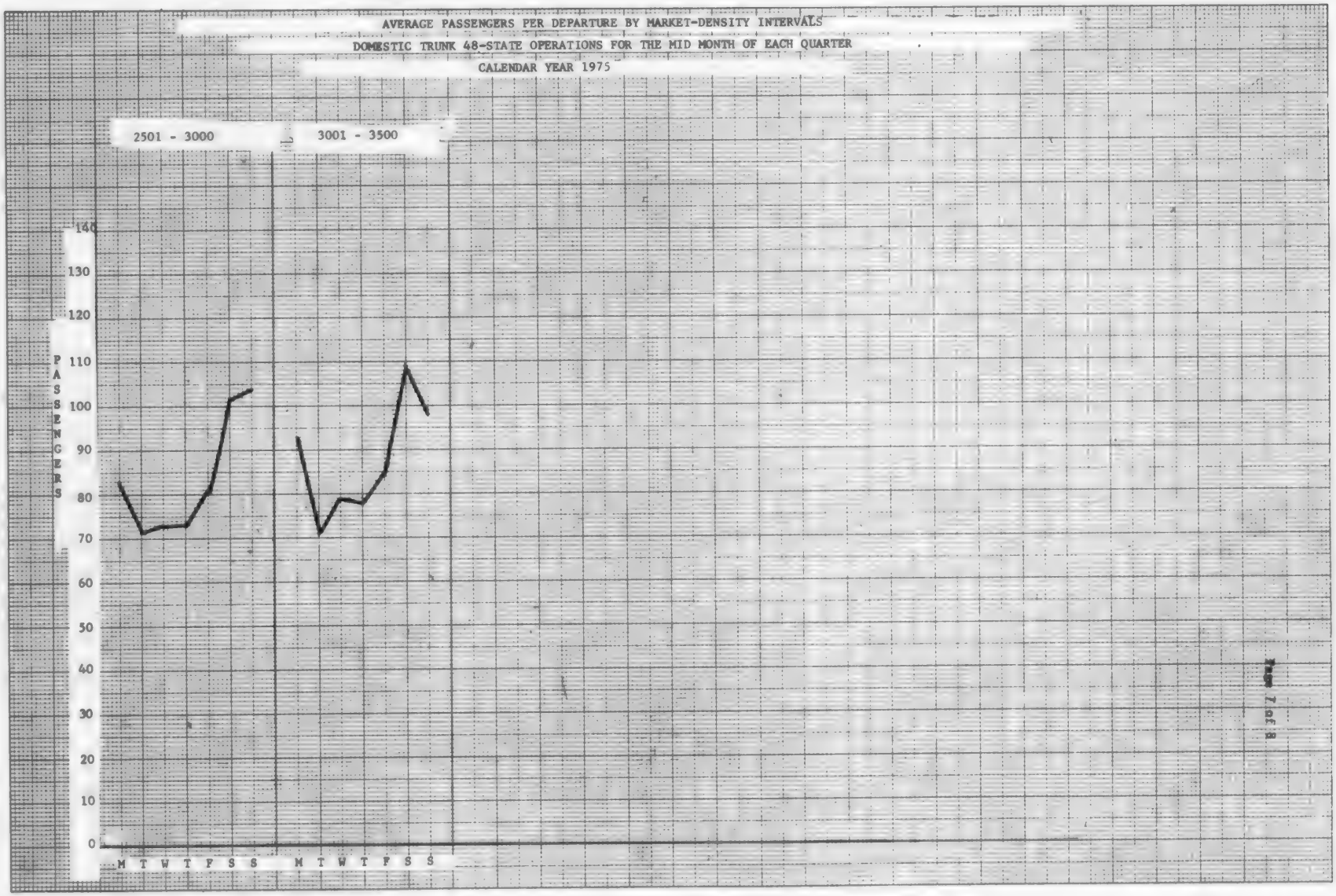

AVERAGE LOAD FACTOR BY DAY OF WEEK
100
90
80
70
60
50
40
30
20
10
COACH
FIRST CLASS
M
T
W
T
F
S
S


INDEX OF RPH's BY DAY OF WEEK BY MILEAGE BLOCK FOR TRUNK CARRIERS
48-STATE OPERATIONS FOR
AUGUST & NOVEMBER 1975 AND FEBRUARY & MAY 1976
100 Miles
300 Miles
500 Miles
1000 Miles
1600 Miles
2200 Miles
2900 Miles
200 Miles
400 Miles
700 Miles
1300 Miles
1900 Miles
2500 Miles
160
140
120
100
80
60
40
M T W T F S S


AVERAGE PASSENGERS PER DEPARTURE BY NUMBER OF COMPETITOR
DOMESTIC TRUNK 48-STATE OPERATIONS FOR THE MID MONTH OF EACH QUARTER
CALENDAR YEAR 1975
1 Competitor
2 Competitors
3 Competitors
4 Competitors
4 Plus Competitors
PASSENGERS
130
120
110
100
90
80
70
60
50
40
30
20
10
0
M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S


AVERAGE PASSENGERS PER DEPARTURE BY MARKET-DENSITY INTERVALS
DOMESTIC TRUNK 48-STATE OPERATIONS FOR THE MID MONTH OF EACH QUARTER
CALENDAR YEAR 1975
0 - 50
50 - 100
101 - 200
201 - 300
301 - 400
401 - 500
501 - 600
PASSENGERS
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
M T W T F S S


AVERAGE PASSENGERS PER DEPARTURES BY MARKET-DENSITY INTERVALS
DOMESTIC TRUNK 48-STATE OPERATIONS FOR THE MID MONTH OF EACH QUARTER
CALENDAR YEAR 1975
601-700
701-800
801-900
901-1000
1001-1500
1501-2000
2001-2500
PASSENGERS
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
M T W T F S S


AVERAGE PASSENGERS PER DEPARTURE BY MARKET-DENSITY INTERVALS
DOMESTIC TRUNK 48-STATE OPERATIONS FOR THE MID MONTH OF EACH QUARTER
CALENDAR YEAR 1975
2501 - 3000
3001 - 3500
PASSENGERS
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
M T W T F S S M T W T F S S

AVERAGE LOAD FACTOR BY CARRIER BY DAY
MID MONTH OF EACH QUARTER FY 1976

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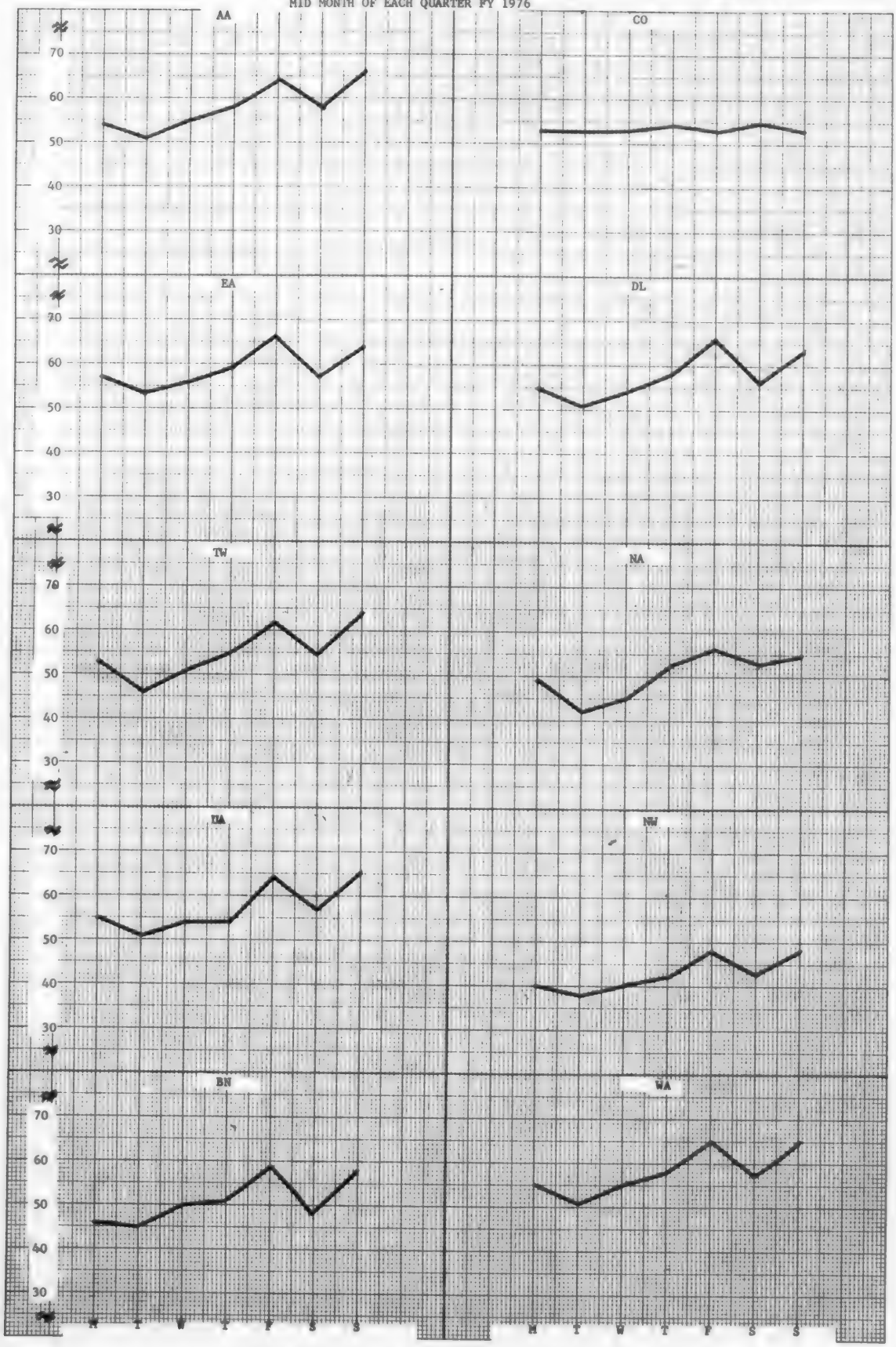

APPENDIX B.—*Comparison of ASM's, RPM's, and load factors for night-coach and nonnight-coach flights of the domestic trunks and local service carriers in the continental United States and Alaska for 1974*[1]

Time of day	ASM's			RPM's			Load factor		
	Night coach	Nonnight coach	Total	Night coach	Nonnight coach	Total	Night coach	Nonnight coach	Total
0001 to 0059	166,426,492	18,501,358	184,927,850	104,388,952	6,231,713	110,620,665	62.7	33.7	59.8
0100 to 0159	63,738,078	24,092,304	87,830,382	42,921,044	8,288,067	51,209,111	67.3	34.4	58.3
0200 to 0259	6,513,390	6,602,704	13,116,094	3,932,240	2,541,106	6,446,346	60.4	38.1	49.2
0300 to 0359	15,763,795	6,951,984	22,715,779	6,318,780	2,670,538	8,989,318	40.1	38.4	39.6
0400 to 0459	0	0	0	0	0	0			
0500 to 0559	0	1,119,800	1,119,800	0	158,808	158,808		14.2	14.2
0600 to 0659	13,912,668	7,911,956	21,824,624	11,564,518	2,032,516	13,597,034	83.1	25.7	62.3
0700 to 0759	0	189,313,943	189,313,943	0	88,629,984	88,629,984		46.8	46.8
0800 to 0859	0	664,396,124	664,396,124	0	335,864,748	335,864,748		50.6	50.6
0900 to 0959	0	792,694,025	792,694,025	0	393,437,487	393,437,487		49.6	49.6
1000 to 1059	0	646,279,240	646,279,240	0	324,892,800	324,892,800		50.3	50.3
1100 to 1159	0	534,772,338	534,772,338	0	277,055,400	277,055,400		51.8	51.8
1200 to 1259	0	818,128,881	818,128,881	0	441,305,348	441,305,348		53.9	53.9
1300 to 1359	0	663,006,624	663,006,624	0	367,692,555	367,692,555		55.5	55.5
1400 to 1459	0	316,316,542	316,316,542	0	183,531,078	183,531,078		58.0	58.0
1500 to 1559	0	322,445,547	322,445,547	0	193,120,805	193,120,805		59.9	59.9
1600 to 1659	0	470,194,153	470,194,153	0	279,813,481	279,813,481		59.5	59.5
1700 to 1759	0	701,528,708	701,528,708	0	392,444,396	392,444,396		55.9	55.9
1800 to 1859	0	474,521,958	474,521,958	0	279,455,019	279,455,019		58.9	58.9
1900 to 1959	0	183,074,294	183,074,294	0	113,798,294	113,798,294		62.2	62.2
2000 to 2059	0	178,479,181	178,479,181	0	92,744,569	92,744,569		52.0	52.0
2100 to 2159	421,851,428	36,222,488	458,073,916	279,194,796	20,937,042	300,131,838	66.2	57.8	65.5
2200 to 2259	414,592,474	30,174,608	444,767,082	256,686,197	15,385,945	272,072,142	61.9	51.0	61.2
2300 to 2400	13,676,398	150,689,175	164,365,573	7,335,484	73,585,116	80,920,600	53.6	48.8	49.2
Total	1,116,474,723	7,237,417,935	8,353,892,658	712,342,011	3,895,589,815	4,607,931,826	53.8	53.8	55.2

[1] Source: Docket 26510, exhibit BE-R-1011.

APPENDIX C—PEAK AND OFF-PEAK PRICING

PEAK AND OFF-PEAK PRICING

As has been indicated, the ability to adjust load factors by manipulation of supply is hampered by the potential for significant passenger rejection. This potential will remain a real threat as long as the intensity of the monthly, daily, and hourly demand peaks remains unabated.

The obvious answer to the question of how best to modify the intensity of demand peaks is a system of peak and off-peak pricing. In the past, discount fares have been used to this end with little success. Thus, a new scheme of peak and off-peak pricing is needed—one that rigorously defines peak and off-peak periods and the fares applicable thereto.

As described in the text, three types of demand peaking are readily apparent in the airline industry—seasonal or monthly, day of the week, and hour of the day. These peaking patterns suggest a pricing structure that reflects differences in hourly peaking for peak and off-peak days and months. An example of such a structure has been developed using cost data for a trip length of 700 miles developed under Costing Methodology, Version 6, and traffic-capacity and load-factor data supplied by trunk carriers in this investigation. The results are as follows:

Peak and offpeak pricing schedule; average costs or fares at 700 mi

	Total	Season	Day of week	Hour of day
Total	$62.52			
Peak month		$72.64		
Peak day			$81.35	
Peak hour				$80.72
Offpeak hour				78.54
Offpeak day			68.80	
Peak hour				69.18
Offpeak hour				67.26
Offpeak month		58.14		
Peak day			66.84	
Peak hour				67.19
Offpeak hour				65.31
Offpeak day			53.73	
Peak hour				54.01
Offpeak hour				52.50

This structure was computed according to the methodology described on page 22 of the text. The results indicate a spread between average fares for peak and off-peak seasons of 25 percent. This spread is increased to 52 percent when both daily and monthly peaks are considered and increased to 54 percent when hourly, daily, and monthly differences are all considered. The modest increase in the percentage when hourly demand variations are taken into account reflects the fact that a large percentage of the total RPM's (about 80 percent) occur during the peak hours, and, thus, the cost of excess off-peak capacity can be spread over a large base. Further, and perhaps more importantly, it also reflects the degree of demand smoothing already accomplished by the implementation of night-coach fares.

Indeed, the night-coach experience offers an historical example of the demand smoothing effect obtainable through peak and off-peak pricing techniques. Data filed in the Domestic Night Coach Fare Investigation, Docket 26510, indicate that in 1974, load factors in night-fare segments averaged 63.8 percent or 8.1 points higher than day-fare segments in the night-fare markets. During that same period, non-night-fare segments between 9 p.m. and 6:59 a.m. exhibited load factors averaging only 46.7 percent. It can be concluded, that the overall load-factor improvement in the night-coach markets which may be reasonably attributed to the night-coach form of peak and off-peak pricing is somewhat greater than the 2.5-point spread between the average day-fare load factor (55.7 percent) and the overall load factor (58.2 percent).

In view of the foregoing, the existing, already partially smoothed demand patterns may be seen to provide an inadequate base for establishing appropriate fare differentials between peak and off-peak hours of the day. A possible, alternative could be developed by examining the demand fluctuations during peak and off-peak hours in those markets with late night flights but without night-coach fares.

Further, it should be made abundantly clear that the process of developing peak and off-peak prices will be iterative. It is simply too much to expect that the optimum price differentials can be developed at first shot. After such pricing is placed into effect, a period will exist during which adjustments will be found necessary. Perfection is a goal to be worked toward, but not one that can be instantly attained.

For purposes of the illustrative peak and off-peak fares computed herein, peak and off-peak periods are defined as follows:

Period	Peak	Offpeak
Month	August	February, May, November.
Day	Friday and Sunday	Monday, Tuesday, Wednesday, Thursday, and Saturday.
Hour	8 a.m. to 6:59 p.m.	7 p.m. to 7:59 a.m.

For the domestic system in general, these definitions would be expanded to include June and July as peak months and all other months as off peak. The day and hour peak definitions would stand, with the possible exceptions of holiday periods.

Undoubtedly, optimum peak and off-peak definitions would differ in some areas. For example, monthly definitions in North/South markets could differ from those in East/West markets. Also Saturday may be included among the peak days in some markets. The number of differences, however, should be small enough to allow the process to work.

Computation of peak and off-peak fares at 700-mile trip-length costs

Peak and offpeak fares—seasonal

Cost/RPM	8.931¢
VC at 30 pct	2.679¢
FC at 70 pct	6.252¢
at 55.9 pct	3.495¢/ASM
4 mo RPM's	36,898,343
Total cost	3,295,391
VC at 30 pct	998,617
FC at 70 pct	2,306,774
4 mo ASM's	65,816,526
VC/RPM	2.679¢
FC/ASM	3.505¢

(1) OPF=2.679¢+(3.505÷0.623)
2.679¢+5.626¢=8.305¢
$58.14/PAX at 700 mi

(2) PF=2.679¢+$\frac{3.505¢[17,648,975+(48,167,551-41,568,734)]}{11,001,022}$
=2.679¢+7.726¢=10.405¢
$72.84/PAX at 700 mi

Proof:
11,001,022×10.405¢=1,144,656
25,897,321× 8.305¢=2,150,773
3,295,429

Peak and offpeak fares—seasonal and daily

Peak month (August)		Offpeak months (February, May, November)	
Total cost=10.405¢×11,001,022=	1,144,656	Total cost=8.305¢×25,897,321=	2,150,773
VC at 30 pct	343,397	VC at 30 pct	645,232
FC at 70 pct	801,259	FC at 70 pct	1,505,541
RPM's	11,001,022	RPM's	25,897,321
ASM's	17,648,975	ASM's	48,167,551
LF	62.3	LF	53.8
Cost per:		Cost per:	
VC/RPM's	3.122	VC/RPM	2.492¢
FC/ASM	4.540	FC/ASM	3.126¢
Peak day:		Peak day:	
RPM's	3,873,163	RPM's	8,713,750
ASM's	5,717,639	ASM's	14,460,732
LF	67.7	LF	60.3
Off peak:		Off peak:	
RPM's	7,127,859	RPM's	17,183,571
ASM's	11,931,336	ASM's	33,706,819

(1) OPF=3.122¢+(4.540¢÷0.677)=9.828¢ or $68.80/PAX at 700 mi

(2) PF=3.122¢+$\frac{4.540¢[5,717,639+(11,931,336-10,528,505)]}{3,873,163}$
=3.122¢+8.346¢=11.468¢ or $80.20/PAX

Proof:
3,873,163×0.11468= $444,174
7,127,859×0.09828= 700,526
1,144,700

(1) OPF=2.492¢+(3.126¢÷0.603)=7.676¢ or $53.73/PAX

(2) PF=2.492¢+$\frac{3.126¢[14,460,732+(33,706,819-28,496,801)]}{8,713,750}$
=2.492¢+7.057¢=9.549¢ or $66.84

Proof:
8,713,750×0.09549= $832,076
17,183,571×0.07676=1,319,011
2,151,087

Peak and offpeak fares—Seasonal, daily, and hourly

Peak month and days		Peak month and offpeak days		Offpeak month and peak days		Offpeak month and offpeak days	
Total cost	0.11468×3873163=444,174		0.09828×7,127,859=700,526		0.09549×8,713,750=832,076		0.07676×1,718,357=1,319,011
YC at 30 pct	133,252		210,158		249,623		395,703
FC at 70 pct	310,922		490,368		582,453		923,308
RPM's	3,873,163		7,127,859		8,713,750		17,183,571
ASM's	5,717,639		11,931,336		14,460,732		33,706,819
L.F	67.7		59.7		60.3		51.0
Cost per:							
VC/RPM	3.440		2.948		2.865		2.303
FC/ASM	5.438		4.110		4.028		2.739
Peak hour:							
RPM's	3,090,784		5,688,031		7,101,706		14,004,610
ASM's	4,419,735		9,222,923		11,395,057		26,560,973
L.F	69.9		61.7		62.3		52.7
Offpeak hour:							
RPM's	782,379		1,439,828		1,612,044		3,178,961
ASM's	1,297,904		2,708,413		3,065,675		7,145,846

(1) OPF=3.440+(5.438÷0.699)
3.440+7.780=11.220¢ or $78.54/PAX

(2) PF=3.440+$\frac{5.438[4,419,735-(1,297,904-1,119,283)]}{3,090,784}$
3.440+8.091=11.531¢ or $80.72/PAX

Proof:
782,379×0.11220= 87,783
3,090,784×0.11531=356,398
444,181

OPF=2.948+(4.110÷.617)
2.948+6.661=9.609¢ or $67.26/PAX

PF=2.948+$\frac{4.110[9,222,923-(2,708,413-2,333,595)]}{5,688,031}$
2.948+6.935=9.883 or $69.18/PAX

Proof:
1,439,828×0.09600=138,353
5,688,031×0.09883=562,148
700,501

OPF=2.865+(4.028÷0.623)
2.865+6.465=9.330 or $65.31/PAX

PF=2.865+$\frac{4.028[11,395,057-(3,065,675-2,587,551)]}{7,101,706}$
2.865+6.734=9.599 or $67.19/PAX

Proof:
1,612,044×0.09330=150,404
7,101,706×0.09599=681,693
832,097

OPF=2.303+(2.739÷.0.527)
2.303+5.197=7.500¢ or $52.50/PAX

PF=2.303+$\frac{2.739[26,560,973-(7,145,846-6,032,184)]}{14,004,610}$
2.303+5.413=7.716¢ or $54.01/PAX

Proof:
3,178,961×0.07500= 238,422
14,004,610×0.07716=1,080,596
1,319,018

Distribution of supply and demand by day of the week; August and November 1975, and February and May 1976

Period	RPM's (000)	ASM's (000)	Load factor
4-month total	36,898,343	65,816,526	56.1
Peak month (August)	11,001,022	17,648,975	62.3
Peak days:			
Friday	1,968,364	2,913,308	67.6
Sunday	1,904,799	2,804,331	67.9
Total	3,873,163	5,717,639	67.7
Offpeak days:			
Monday	1,396,700	2,283,303	61.2
Tuesday	1,246,957	2,264,341	55.1
Wednesday	1,269,086	2,273,587	55.8
Thursday	1,430,406	2,312,745	61.8
Saturday	1,874,710	2,797,360	63.8
Total	7,127,859	11,931,336	59.7
Offpeak months	25,897,321	48,167,551	53.8
Peak days:			
Friday	3,893,686	6,486,853	60.0
Sunday	4,820,064	7,973,879	60.4
Total	8,713,750	14,460,732	60.3
Offpeak days:			
Monday	3,563,200	7,042,739	50.6
Tuesday	3,083,515	6,533,248	47.2
Wednesday	3,333,404	6,481,642	51.4
Thursday	3,438,517	6,429,262	53.5
Saturday	3,764,935	7,219,928	52.1
Total	17,183,571	33,706,819	51.0

Distribution of supply and demand by hour of day[1] August and November 1975 and February and May 1976

Hour of day	Peak month (August)			Offpeak months (February, May, and November)								
				RPM's				ASM's				Factor
	RPM's	ASM's	Load factor	February	May	November	Total	February	May	November	Total	
Peak hours:												
8 a.m. to 8:59 a.m.	758,638	1,344,313		562,852	632,633	514,629		1,205,726	1,234,978	1,084,331		
9 a.m. to 9:59 a.m.	961,156	1,660,228		760,353	771,460	689,800		1,433,660	1,484,117	1,347,613		
10 a.m. to 10:59 a.m.	817,890	1,250,063		629,056	655,308	587,866		1,170,392	1,199,516	1,125,425		
11 a.m. to 11:59 a.m.	694,863	1,053,359		446,934	540,814	459,367		886,729	986,966	914,735		
12 noon to 12:59 p.m.	1,129,041	1,618,611		816,600	839,697	739,253		1,476,807	1,480,982	1,379,387		
1 p.m. to 1:59 p.m.	841,423	1,210,441		611,305	667,792	564,574		1,086,565	1,173,236	998,013		
2 p.m. to 2:59 p.m.	559,185	813,999		494,008	477,868	416,261		815,299	778,707	679,814		
3 p.m. to 3:59 p.m.	560,547	836,002		444,591	475,098	411,919		749,014	784,185	696,739		
4 p.m. to 4:59 p.m.	697,990	1,046,728		593,899	608,825	564,765		1,001,950	985,971	952,813		
5 p.m. to 5:59 p.m.	825,725	1,294,900		737,452	788,011	682,571		1,296,208	1,305,470	1,136,826		
6 p.m. to 6:59 p.m.	790,433	1,291,258		630,829	684,937	593,154		1,104,572	1,195,188	1,056,758		
Total	8,636,891	13,419,902	64.4	6,727,879	7,142,443	6,204,159	20,074,481	12,226,922	12,609,316	10,372,454	35,208,692	57.0
Offpeak hours:												
7 p.m. to 7:59 p.m.	329,817	561,515		269,410	286,044	259,857		541,397	534,312	476,766		
8 p.m. to 8:59 p.m.	231,454	446,842		181,619	174,877	174,719		394,542	551,149	384,936		
9 p.m. to 9:59 p.m.	309,841	576,879		223,475	227,155	189,044		468,244	449,302	404,375		
10 p.m. to 10:59 p.m.	351,143	650,307		295,899	277,268	235,813		605,235	551,729	495,166		
11 p.m. to 11:59 p.m.	147,425	240,090		72,371	106,006	57,774		157,005	178,525	125,487		
12 Midn to 12:59 a.m.	240,366	369,416		122,896	91,618	114,575		308,547	204,795	254,123		
1 a.m. to 1:59 a.m.	73,577	11,414		49,066	28,060	20,685		111,120	70,207	52,178		
2 a.m. to 2:59 a.m.	30,735	53,677		24,468	12,362	13,729		54,788	27,587	29,119		
3 a.m. to 3:59 a.m.	14,378	27,016		14,648	12,759	15,723		36,871	37,352	36,587		
4 a.m. to 4:59 a.m.	28,158	51,530		6,559	6,981	5,606		21,415	21,895	18,786		
5 a.m. to 5:59 a.m.	5,087	14,184		3,276	2,036	3,773		16,215	6,685	15,346		
6 a.m. to 6:59 a.m.	81,062	157,118		54,053	57,545	46,377		135,916	128,466	106,282		
7 a.m. to 7:59 a.m.	347,145	674,878		263,297	294,336	264,295		592,346	602,278	601,776		
Total	2,190,208	3,934,866	55.7	1,581,037	1,577,083	1,401,950	4,560,070	3,343,641	3,164,282	2,980,007	9,487,930	48.1
Grand total	10,827,099	17,354,768	62.3	8,308,916	8,719,536	7,606,109	24,634,551	15,570,563	15,773,598	13,352,461	44,696,622	55.1
Peak as percent of total	79.8	77.3		81.0	81.9	81.6	81.5	78.5	79.9	77.7	78.8	

[1] Total RPM's and ASM's do not equal monthly totals because some flights could not be matched by hour.

APPENDIX D.—*Computation of load factor obtainable through peak and off-peak pricing on a daily and monthly basis*

	RPM's [1]	ASM's [1]	Load factor [1]	Percent change in fare [2]	Traffic adjustment [3]	Adjusted RPM's	ASM's adjusted for monthly traffic change [4]	Load factor	AMS's adjusted for daily change [5]	Load factor	Load factor increase
4-mo total	36,898,343	65,816,526	56.1			37,129,500	59,173,441	62.7	55,313,221	67.1	11.0
Peak month	11,001,022	17,648,975	62.3	+16.5	0.8986	9,885,518	15,867,605	62.3	14,832,463	66.7	
Peak days	3,873,163	5,717,639	67.7	+28.3	.8399	3,253,070			4,805,126	67.7	
Off-peak days	7,127,859	11,931,336	59.7	+10.0	.9355	6,668,112			10,027,339	66.5	
Off-peak month	25,897,321	48,167,551	53.8	−7.0	1.0520	27,243,982	43,305,836	62.9	40,480,758	67.3	
Peak days	8,713,750	14,460,732	60.3	+6.9	.9544	8,316,403			12,153,133	68.4	
Off-peak days	17,183,571	33,706,819	51.0	−14.1	1.1020	18,936,295			28,327,625	66.8	

[1] Source: Daily service-segment data supplied by trunk carriers for August and November 1975, and February and May 1976.
[2] Fare differentials computed in app. C.
[3] Assumes an elasticity of −.7.
[4] ASM's are adjusted to maintain peak month load factor while maintaining the existing ratios with offpeak periods and within the month.
[5] ASM's are adjusted to maintain August peak-dayload factor while maintaining the existing ratios of ASM's between peak and offpeak within the month and while maintaining the existing ratios of ASM's between months.

APPENDIX E.—*Fuel consumption and potential savings midmonth of each quarter 1975*

Domestic trunks	February	May	August	November	Total
Scheduled operations revenue aircraft-miles (thousands):					
Mixed services	115,506	124,791	132,512	116,990	489,799
All cargo	3,672	4,093	3,777	3,227	14,769
Total	119,178	128,884	136,289	120,217	504,568
Percent of mixed to total	96.9189	96.8243	97.2287	97.3157	97.0729
48-State scheduled services:					
Gallons of fuel used	470,462,171	500,392,388	535,642,279	470,281,506	1,976,778,244
Percent allocation to mixed services	96.9189	96.8243	97.2287	97.3157	97.0729
Gallons used in mixed services	455,966,761	484,501,427	570,798,025	457,657,740	1,918,916,065
Scheduled ASM's (thousands)	15,131,039	16,366,431	17,708,921	15,264,819	64,471,210
Gallon per ASM	.030135	.029603	.029409	.029981	.029764
Gallon per RPM at 55 percent LF	.054791	.053824	.053471	.029981	.054116
Gallon per RPM at 60 percent LF	.050225	.049338	.049015	.049968	.049607
Savings per RPM					.004509

[FR Doc.77-14440 Filed 5-23-77;8:45 am]